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Supporting practitioner-led inquiry into classroom dialogue with a research-informed professional learning resource: A design-based approach

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Research indicating the educational value of classroom dialogue, in which participants engage critically and constructively with other perspectives, is long established but classroom practice evolves slowly. Outcomes of practitioner professional development in this area are inconsistent and often dependent on costly, external input. Our study aimed to understand whether and how practitioner-led inquiry may offer an alternative, sustainable and scalable way of developing dialogic practices, characterising effective organisational models. The Teacher Scheme for Educational Dialogue Analysis (T-SEDA) resource pack was designed to support iterative cycles of practitioner inquiry based on systematic analysis of classroom dialogue and reflecting critically with peers, using customisable coding tools and templates. This open resource embeds research findings about dialogue forms that are productive for student learning. We report our design-based research comprising nested inquiry cycles involving 74 practitioners from early years to tertiary levels. Data were derived from surveys, inquiry reports and interviews. Participants successfully used and adapted the resources for their own goals, needs and diverse contexts across seven countries. The largely autonomous process was typically supported by local facilitators working with groups of practitioners; data analysis focused on illuminating models of institutional organisation of inquiry, uses of T-SEDA resources, participant perceptions and factors underlying (dis)engagement. The findings offer insights into knowledge mobilisation and educational change processes. They yield design principles for scalability and sustainability based on a non-prescriptive model of local ownership and facilitation of self-directed practitioner inquiry and purpose-driven adaptation in complex educational circumstances.

Keywords classroom dialogue, practitioner inquiry, design-based research, professional development resources.

Introduction

There is increasing international research interest in educational dialogue as a form of classroom discourse that supports learning through interaction with others. Through dialogue participants explore and critically evaluate different perspectives (Bakhtin,

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1981), pose open questions, build on others' ideas and participate in shared reasoning and thinking (e.g., Resnick *et al.*, 2015; Mercer, 2019). However, classroom practice has been slow to evolve. In most classrooms, teacher talk still dominates and students' participation is passive and limited. A number of practitioner professional development (PD) programmes have attempted to address this, using various formats and with mixed success (Hennessy & Davies, 2020). Most programmes are underpinned by traditional models of research impact based on unidirectional intervention designs. They align with other areas of educational research which have traditionally framed teachers as 'users' instead of 'producers' of knowledge (Jones *et al.*, 2015). Yet this model of producing research evidence for teachers to use has long been challenged, with significant barriers now generally recognised, namely, the quality of the primary research, the multiple demands on practitioners and policy-makers, the skills and attitudes of potential 'users' and the mismatch with practitioners' needs (Gorard *et al.*, 2020). Local contextualisation is key; findings from evaluation of an intervention that 'it worked' do not predict that 'it will work here' (Joyce & Cartwright, 2019). Furthermore, PD programmes relying on external expertise and funding typically fail to consider the long-term implications of withdrawing external support. Osborne and colleagues considered a school-led approach based on minimal support without extensive PD and coaching problematic (Osborne *et al.*, 2013).

However, the landscape is shifting. In many countries there is an increasing drive for teachers to become actively research engaged, for instance with the establishment of a 'Chartered College of Teaching' in the UK[1] and professional 'inquiry' being mandated in New Zealand. Inquiry approaches involve teachers (individually or collegially) in actively identifying and investigating problems of practice in their own contexts. It has previously been argued that collaborative development of inquiry tools and resources is a fruitful way of university researchers supporting practitioners' activities (Vrikki *et al.*, 2019). Our approach aims to move away from conventional PD intervention designs and embraces practitioner-led inquiry supported by research-informed professional learning resources.

This paper presents a study of practitioners using the Teacher Scheme for Educational Dialogue Analysis (T-SEDA), which is an inquiry-based professional learning approach. It comprises a comprehensive set of openly available tools and resources for supporting development of dialogic pedagogy. Its distinctive feature is practical guidance and a coding scheme for practitioners to *systematically* micro-analyse classroom interaction and hence monitor and reflect on their own and peers' dialogic practices. This approach to PD adopts a design-based research (DBR) methodology. As discussed further below, DBR in education often involves collaboration between practitioners and researchers in iteratively trialling new educational approaches. This leads to new understandings of learning and teaching, which can inform practice in different settings. This approach is essentially forward looking and value-driven, aiming for educational improvement. Research and practice are intertwined and respectful of the goals, beliefs and opinions of all involved. In this context, material PD resources have a key role in communicating research findings and building knowledge in flexible collaboration with practitioners working in complex educational circumstances.

The T-SEDA approach embeds the principles of the DBR model in that it offers encouragement and tools for purpose-driven modification of dialogic practice,

drawing on the results of practitioner inquiry. T-SEDA comprises loosely structured resources that can be used in various ways, across curriculum areas and age ranges; they are informed by scholarly research in the field. The core toolkit is designed to support practitioners who wish to develop and embed classroom dialogue into their own settings. Practitioners engage in cycles of designing, testing and refining activities for imminent lessons, targeting specific dialogic practices. This carries the expectation that practitioners will in turn contribute to research knowledge through reporting their own classroom inquiries, including feedback for developing the T-SEDA resource itself.

Focus and outline

An earlier publication reported on the development and small-scale pilot testing of T-SEDA by a mixed group of researchers and teachers (Vrikki *et al.*, 2019), and was followed by small-scale testing by practitioners in three countries. We have subsequently conducted large-scale testing across 10 countries (to date), allowing us to investigate different inquiry approaches and support needs. Forthcoming publications will report on the marked shifts observed towards more dialogic teaching practices and elaborate the role of practitioner agency. In this article we focus on the nature, take-up and organisational facilitation of the T-SEDA professional inquiry approach, including the supporting and constraining factors influencing the operation of different models across very diverse contexts. We offer insights for other researchers and educators wanting to support and develop dialogic approaches. After summarising the background literature informing our work, we outline the research focus, methodology and then report and discuss the findings. We describe how the research team continued to learn from practitioner feedback and adapt the T-SEDA materials accordingly. We draw some conclusions about the inquiry models emerging, including some design principles for scalability and sustainability.

Background and context

What is dialogue?

Dialogue essentially refers to the human encounters between people in which gaps or differences between perspectives are foregrounded as a creative source of new insight (Bakhtin, 1981). Theoretical perspectives on dialogue draw on sociocultural theory (Vygotsky, 1978), highlighting the co-construction of new meanings when participants engage actively and critically with others' ideas.

In productive classroom dialogue, knowledge is developed collectively over time between students, teachers and other stakeholders. In practice, we would see students and teachers sharing ideas, justifying contributions and making reasoning explicit, in talk and through other means of multi-modal communication. Dialogue does not mean any kind of talk. It distinctively involves acknowledging and capitalising on different perspectives, cumulatively building on each other's ideas, making reasoning explicit, coordinating positions, speculating and inquiring. It is framed by a willingness and capacity to engage in critical thinking and evaluation, reflecting also on

one's own dialogue and reasoning (Resnick *et al.*, 2015; Mercer, 2019; Alexander, 2020). This type of dialogic engagement is undoubtedly challenging for students and teachers. It depends on a trusting ethos that supports respectful challenge of different perspectives and reasoning. This depends in turn on teachers creating a supportive classroom climate for risk taking, plus opportunities for multiple students to participate actively and learn together (Howe *et al.,* 2019). This is why research on educational dialogue may include investigations not only of dialogic form but also of the wider conditions that support dialogue (e.g. the roles of classroom culture, educational aims and beliefs, social relations, physical and managerial conditions: Kershner *et al.*, 2020b).

Research on classroom dialogue

Interest in dialogue has expanded greatly in recent years with international appeal and relevance, as demonstrated in a recent handbook of this field (Mercer *et al.*, 2020). In their review of the extensive field of dialogic education, Kim and Wilkinson (2019) note two broad bodies of work (although with inevitable overlaps) focusing on conceptions of dialogic pedagogy and on forms of dialogic teaching and learning. The difference lies in emphasis given to dialogue as a general pedagogical framework or a specific discourse practice. Researching the forms and functions of classroom discourse has become a thriving sub-field (Wells, 1999; Nystrand, 2006; Lefstein & Snell, 2014; Resnick *et al.,* 2015; Hennessy *et al.,* 2016b; Mercer, 2019; Hardman, 2020), and this is the context of the T-SEDA project reported here.

Two recent large-scale studies, involving detailed analyses of lessons in primary/elementary (ages 9–11) schools in England, have encouragingly demonstrated that certain forms of teacher-student dialogue are strongly linked to student learning and positive attitudes to school (Alexander, 2018; Howe *et al.,* 2019). Yet, in practice, a standard teacher-student communication pattern of 'initiation-response-feedback' (IRF: Sinclair & Coulthard, 1975) still prevails in many cases (Howe & Abedin, 2013). It is characterised by teachers' undemanding closed questioning and evaluation of correctness of students' answers. This 'recitation' model serves to control student participation, without promoting deep understanding of the subject.

The review by Hennessy and Davies (2020) identifies the key reasons for low prevalence of dialogic approaches in everyday practice. These include the demands on teachers who must critically evaluate students' arguments (Wilkinson *et al.,* 2017); generate live, contingent and probing responses; change their mindset to value students' ideas; create a climate that supports student empowerment and risk taking; simultaneously manage coherence, student motivation, equity and time; and develop student skills for oracy, interthinking and reasoned critique (Park *et al.,* 2017, p. 21). Hennessy and Davies found adoption of dialogic approaches to be particularly limited in secondary schools, tending to focus primarily on science learning. Moreover, learning-focused dialogue is frequently unsupported by policy, assessment or school culture; teachers may not find its rationale sufficiently persuasive or have enough professional knowledge. All these reasons support the need for more practitioner-led approaches relevant to local contexts and purposes.

Through close analysis of 72 of the primary lessons (36 teachers, two subjects each) observed by Howe *et al.* (2019), Vrikki *et al.* (2019) found that non-dialogic talk dominated lessons overall, but there was wide variation. In the 'pockets of excellence' that were noted, teachers were shaping classroom talk by inviting students to respond dialogically. Interestingly, at the 'micro' level of analysis, Vrikki *et al.* found differences between the dialogic moves of 'elaboration' and 'reasoning' in use, with the latter apparently more sensitive to teachers' previous PD experience. This suggests that PD can usefully focus on specific mechanisms of dialogic interaction (as in the T-SEDA approach), not just broad dialogic principles.

Professional learning approaches for supporting dialogue

Designs and methodological issues. Professional development has been considered a key lever of teachers' and subsequently students' learning. However, programmes can take various forms and achieving and measuring their success remains challenging (Hill *et al.,* 2013). In recent years, numerous international efforts to support teacher understanding and practice of dialogic teaching have been reported in the literature. A popular approach involves introducing tools and strategies to promote dialogue alongside their theoretical and/or empirical rationale. This can take the form of face-to-face intensive workshops, such as in the Dialogic Video Cycle in Germany (Pehmer *et al.*, 2015), or coaching-based programmes like the work of Šed'ova and colleagues in the Czech Republic (Šed'ova *et al.,* 2016), and Wilkinson and Reznitskaya's programme to promote inquiry dialogue (Wilkinson *et al.,* 2017). Reflection-based PD is also common and focuses on examining and questioning existing practices to promote teacher change (Lefstein & Snell, 2014). Usually, this takes place through professional learning communities formed by teachers and researchers that use materials of practice (typically videos but also other artefacts).

Despite their differences, these programmes share some common features, importantly their reliance on external providers (typically researchers) designing the materials and usually conducting the programmes. They are typically small scale, although an exception to the latter is a recent randomised control trial conducted in England by Alexander, Hardman and Hardman that included 80 teachers working with 38 peer mentors and demonstrated significant impact on student achievement and teaching practices (Alexander, 2018). Intensive engagement over long periods is demanding yet has been identified as important to shift mindsets and meaningfully employ new practices (O'Connor & Michaels, 2019). In turn, the success of available PD programmes in impacting classroom practices is mixed (Hennessy & Davies, 2020).

Methodological issues aside from scale and duration have further constrained the impact of PD initiatives on teachers' understanding; these include variable degree of take-up and failure to consider potentially confounding factors (Hennessy & Davies, 2020). Studies with (quasi-)experimental designs commonly approach evaluation of interventions by striving for 'implementation fidelity'. Even where there is a careful compromise involving both a directed focus and a responsive focus as in the aforementioned study by Alexander (2018), a case can be made for rigorous comparisons with compulsory participation (Osborne *et al.,* 2013) and/or random assignment of

teachers to standardised conditions, in order to isolate key factors underlying success (Hill *et al.*, 2013). However, the design principles of teacher agency to effect change and local contextualisation underpinning T-SEDA are intentionally the antithesis of such an approach.

Further challenges are those of scale and sustainability, including follow-up research and scalable PD. Aside from reaching a larger number of settings, scale has been defined as including the depth of practitioners' changes, their spread within and across classrooms, their sustainability beyond the presence of external support, and the ownership of local actors over a proposed reform (Coburn, 2003). Practitioners' learning and associated changes to classroom practice are supported by local 'knowledge-building facilitation' (O'Connor & Michaels, 2019, p. 174).

Hennessy and colleagues' OER4Schools programme in Zambia addresses several of these issues. It was developed and piloted in collaboration with schools, creating substantial open resources for peer-facilitated, school-based PD to promote interactive teaching. It was run in 12 classes over a school year in one main primary school with limited remote support for the facilitator which faded over time (Hennessy *et al.*, 2016a). A follow-up study 18 months later demonstrated sustainability of the new pedagogical practices without any support from the research team, plus spontaneous extension of the approach to the whole school by peer facilitators (Haßler *et al.*, 2020). Key to the sustainability and further evolution were the balance between a structured programme and supporting teachers' agency to develop and implement classroom practices. The researchers concluded that its participatory, iteratively developed and culturally responsive nature, emphasising local ownership and teacher voice, was an important precondition.

Building in part on the work in Zambia, Calcagni's (2020) mathematics-focused programme in three Chilean primary schools was peer-facilitated, supported by guidelines and materials including readings, video exemplars and reflective cycles of planning and reviewing. Participants progressed with regards to dialogic practices involving participation and elaborating ideas. These international PD experiences instilled confidence to design and trial the much more loosely structured set of T-SEDA resources for even greater teacher adaptation and ownership.

Previous PD research has tended to focus on impacts on teachers and/or pupils without necessarily considering the implementation conditions in different educational settings (Borko, 2004). In considering these conditions, the role of local leadership practices and prioritisation of teacher learning is central. Indeed, a best-evidence synthesis by Robinson *et al.* (2009) of research on leadership practices related to improving student outcomes indicated that the effect size of one dimension, namely, leaders 'promoting and participating in teacher learning and development'—as leaders, teachers or both—was twice that of any of the other four dimensions (establishing goals and expectations; planning, coordinating, and evaluating teaching and curriculum; resourcing strategically; ensuring an orderly and supportive environment). PD programmes promoting dialogue have rarely explored these links. In the Chilean study, however, school leadership support proved pivotal; alongside teacher-facilitators' commitment to sustain the project, it appeared to differentiate the two schools that completed the project from the one that withdrew (Calcagni, 2020).

The role of material resources. Offering structured guidance to support theoretical and practical teacher learning has been identified as key (Hennessy *et al.,* 2016b). The educational dialogue field has seen the development of numerous resources (e.g. the Oracy Toolkit, Thinking Together and Academically Productive Talk moves) that in some cases are openly available and may therefore be used stand-alone by teachers. Yet their actual use and appropriation in authentic classroom contexts without external support, especially at scale, is not well documented. This relates to the fact that such materials are usually one-way designs, whereby research teams develop and deliver them without necessarily incorporating participants' learning as a source of further development. Therefore, approaches rarely establish a two-way dialogue between research(ers) and practice that could not only be mutually enriching but also support properly contextualised evaluation. As Rowan (2008) critically discusses, this one-way delivery fits with an 'industry' model of publishing resources for professional development and school improvement.

There also remains the specific question of how underpinning dialogic principles and research evidence are presented and used. Successful 'user engagement' in research may depend on how research evidence is modified, 'engineered into a more usable format' (Gorard *et al.,* 2020, p. 570) and presented to practitioners 'actively and often iteratively' (p. 598). In a study of English secondary schools, Cain (2015) found that teachers were more likely to use research findings in 'conceptual' ways to think individually and collectively about their experience and practice in long, focused discussions, rather than directly applying research findings in instrumental and strategic ways. Research offered a 'third voice', to add (somewhat subordinately) to their own and their colleagues' voices. For T-SEDA, we ensured the provision of information about dialogic theory and research was accompanied by space for practitioners' discussion and ownership of this information.

Our approach involves creating open materials for independent use while remaining engaged with practitioners to inform the materials. Open educational resources (OER) are increasingly available in higher education and particularly significant for educational systems with limited resources (Lane, 2017). OER are openly accessible resources that are licensed for reuse and adaptation, thereby increasing sustainability, scalability, equity, local ownership and cost-effectiveness. However, as Wolfenden and Adinolfi (2019) establish in their study of the localisation of OER in India, materials require both contextual adaptation and linguistic translation to engage learners authentically, encourage creative responses, and disrupt embedded hegemonic cultural assumptions. Professional agency can only then be exercised in envisioning and implementing new educational practices.

The Teacher-SEDA professional inquiry approach and take-up

The design of the T-SEDA approach was based on the research-informed premise that for deep change in classroom interaction, teachers need opportunities for systematic and reflective inquiry in order to scrutinise their own practices in light of intended goals, to test new approaches and learn from trial and error (e.g. Wilkinson *et al.,* 2017). T-SEDA is an openly accessible, comprehensive and innovative (70-page)

resource that includes analytic tools to systematically assess the nature of dialogue (see Figure 1).

Key components supporting practitioner self-reflection activities include guidance for choosing an inquiry focus and a 'self-audit' tool that invites ratings of frequency of key elements of dialogic teaching. A reflective cycle template (see Figure 2) helps to structure practitioner inquiries.

The pack explains the theoretical rationale and shares the research evidence underlying the approach, a principle identified as a key success factor in PD in this area (Osborne *et al.*, 2013). The content focuses on specific elements of dialogue revealed as productive for student learning in the literature, especially highlighting those emerging in the large-scale study of 72 teachers by Howe *et al.* (2019): *Inviting or providing elaboration of previous contributions; querying, challenging or disagreeing with others' ideas; active participation by multiple students across a lesson*. These are summarised in a coding framework that identifies and defines forms of dialogic talk (Appendix S1). T-SEDA was based on the finer-grained Cam-UNAM *Scheme for Educational Dialogue Analysis* (SEDA) developed by Hennessy *et al.* (2016b).

Systematic inquiry is supported by a range of observation templates for teacher-student and peer dialogue. Further practical tools are derived from the wider research literature on promoting dialogue, including scales for student participation and groupwork quality (strongly associated with learning gains: Howe *et al.*, 2019); and

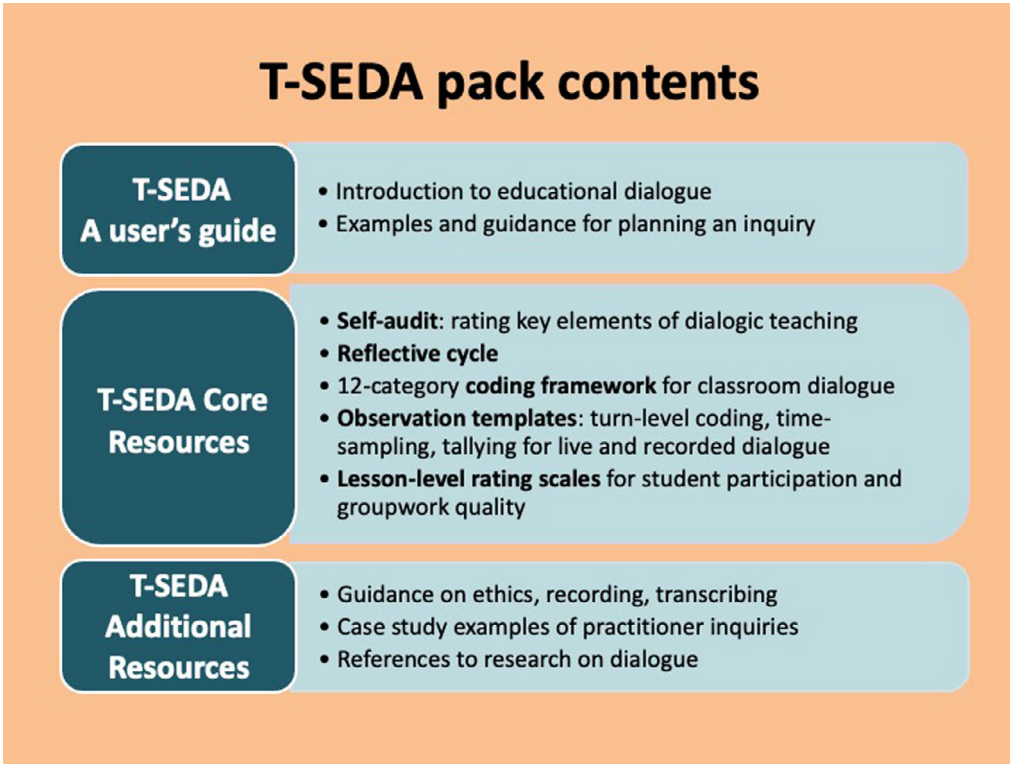

Figure 1. Contents of the T-SEDA pack

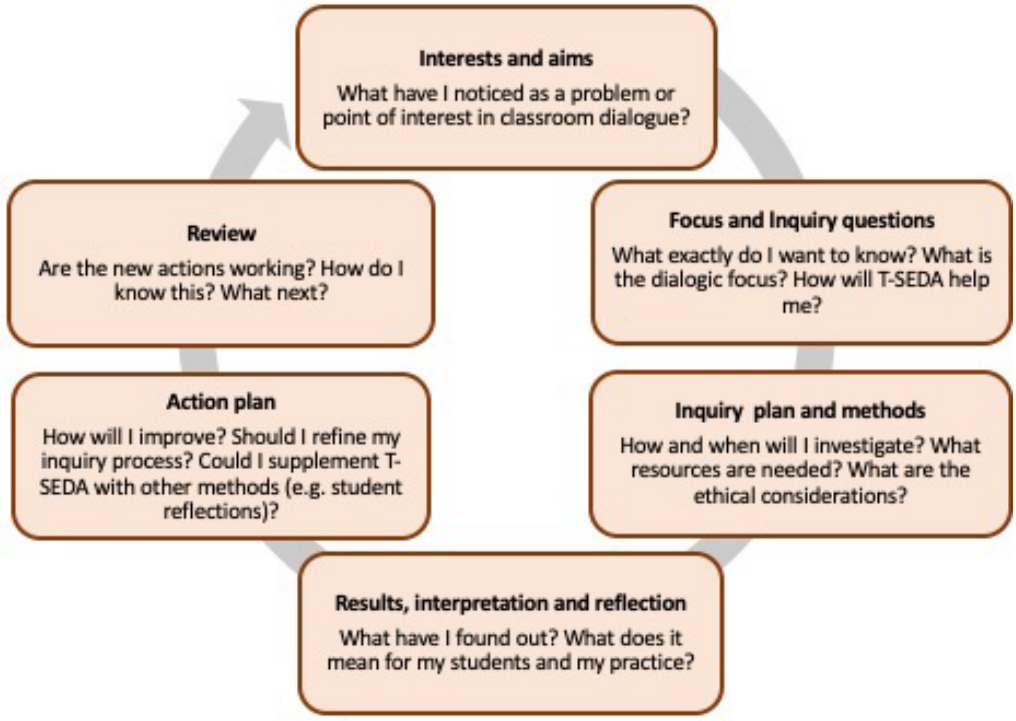

Figure 2. The reflective cycle

the use of 'ground rules' and 'talking points' (Mercer, 2019). Finally, a set of lesson video clips (from our earlier studies) illustrating dialogic practice is openly accessible as a supplementary online resource; video exemplars are known to act as powerful stimuli for reflection and change (Pehmer *et al.*, 2015). Potential uses of the T-SEDA resources include professional learning for individual/groups of teachers/lecturers or school networks; pre-service teacher education; observation of peers by teachers or students.

Design-based research

T-SEDA's development over several years has comprised an iterative design-based research (DBR) approach (Bakker, 2018). DBR involves systematically conducting studies that comprise the design, development and evaluation of new learning environments, professional development programmes, tools, technologies and materials, integrated with a concern to test or develop theory. DBR has captured the attention of many educational researchers in the last decade, particularly those concerned with educational improvement. This interventionist approach recognises the need to understand complex educational processes in terms of 'distributed' thinking between all involved in educational activity (Barab & Squire, 2004).

As with other approaches connecting research and practice in cyclical investigations, such as action research (Stenhouse, 1975), design research is envisaged as a

flexible, reflective and responsive process pragmatically employing a diverse range of methodological strategies. Design research places greater explicit emphasis on theoretical development as part of improving practice, with a view to application and transferability to different contexts, commonly expressed as 'design principles'. This can also be seen as 'knowledge mobilisation', which, as Hood (2018, p. 590) summarises, 'describes the movement of knowledge into active use, in any setting and with any combination of actors'. The processes of knowledge building through research depend on willingness to incorporate the different beliefs and voices of those concerned (Wegerif, 2020).

The DBR approach contrasts directly with some other approaches used in educational research, such as quasi-experiments or randomised control trials as mentioned above. As T-SEDA inquiries are situated in local practice, DBR initially prioritises local adaptation in order to maximise success and build knowledge about application in different contexts. Individual projects are linked in their adherence to the common principles embedded in the T-SEDA approach and materials allowing contextual similarity and variation to become part of the knowledge base.

Professional development for dialogic teaching has rarely employed DBR explicitly (although a study by Wilkinson *et al.*, 2017 is an exception). In contrast, T-SEDA has built cyclically on the learning and outputs from a series of prior design research studies executed by Hennessy and colleagues over the past decade (see Hennessy, 2014; Hennessy *et al.,* 2018; Vrikki *et al.,* 2019). For example, the current self-audit is adapted from a previous version generated through close teacher-researcher collaboration exploring the use of technology in supporting whole class dialogue. The original was published in a professional development resource book co-authored with participating practitioners (Hennessy *et al.,* 2014).

T-SEDA continues to develop beyond its original design. For instance, translation of the pack into Chinese and Spanish has been undertaken to maximise opportunities for global reach. Professional translations were checked and further developed in collaboration with Chinese, Taiwanese, Chilean, Spanish and Mexican colleagues with familiarity with dialogue. Colleagues also drew on their understanding of their native country's language and educational contexts, and on knowledge gained through conducting their own 'satellite' dialogic inquiries. A French-English bilingual, all-years school in London recently translated the pack into French too, extending use across the curriculum.

International take-up of the approach and tools by individual teachers, schools, school networks and higher education institutions (HEIs) has been widespread, spontaneous (typically without direct intervention from our university team) and sustained (over successive school years). Launched in 2017, T-SEDA has been used in at least 10 countries: Australia, mainland China, England, Hong Kong, Israel, Mexico, New Zealand, Pakistan, Spain and Taiwan. In particular, there has been large-scale, significant and sustained take-up in Israel since 2017, using a Hebrew version of the pack and involving at least 225 teachers. The web page hosting the resources has received over 5000 unique page views since its creation in Spring 2018.

Current research focus and questions

During 2018–19, 74 of the 360 practitioners who have used T-SEDA to date (early 2021) took part in a research study over 15 months, yielding the data reported in this paper. Our focus here is understanding practitioners' motivations for conducting T-SEDA inquiries from early years[2] to higher education levels, and the organisational structures and factors that supported and hindered them. Our research questions were:

1. Why might individual practitioners engage with and disengage from T-SEDA inquiry?
2. What are the organisational structures and circumstances supporting engagement with T-SEDA in different local settings?

Through our account of the conditions that support or obstruct use of T-SEDA, we aim to elicit some design principles for scaling and sustaining productive practitioner professional inquiry in diverse contexts, without direct support from the original research team.

Methodology

Participants

The 74 participants comprised 45 from England and 29 internationally, based in 20 institutions. The geographical spread within England spanned East Anglia, London, Slough (Berkshire), Lancashire and Surrey (see Table 1 in Findings). Globally, practitioners from New Zealand, Hong Kong, Israel, Spain, Mexico and Pakistan took part in the study in a variety of educational contexts. Participants spanned teachers in early years and primary education up to higher education (HE); early years (n = 14) teachers, primary teachers (n = 37) and HE lecturers (n = 14) were the biggest groups, with secondary schools and further education under-represented (n = 3). Remaining participants were a primary head teacher, a primary subject leader and a teaching assistant in an all-age school.

Participants were recruited via general advertising (e.g. via Twitter) and our own professional contacts, as well as through our existing research group channels for communication with affiliated international members. In most cases, participants were part of 'clusters' within or across institutions and local facilitators (n = 12 in 11 settings) supported them in their professional development. The term 'facilitators' is used very broadly as they adopted varying roles and levels of involvement in the practitioner inquiries (See Findings section 'Professional inquiry contexts and structures'). One facilitator was the fourth co-author of this article. Table 1 in the Findings section summarises the demographics of the participants in this study.

The take-up included three groups based in higher education (HE) in England, Mexico and Hong Kong who adapted resources for use with teachers and colleagues. They used T-SEDA in their own undergraduate and Master's teaching, including extension beyond the discipline of education by lecturers in two settings (Hong Kong, Mexico). Given that our thinking had mainly been directed at school settings, we

were initially surprised at the take-up of T-SEDA in HE. Two of the HE facilitators were known to us beforehand but we did not directly invite their participation in the study. They nevertheless proactively launched these initiatives in response to perceived local needs and informed us afterwards, just as colleagues in New Zealand (and Israel) independently used T-SEDA with practitioners for several months before making contact.

Procedure

The study began for some participants in England with an introductory workshop and meeting with fellow practitioners and their local facilitator. These were run by the research team usually face-to-face in university and school locations, and in a few cases online for remote participants, including in Mexico and Pakistan. Other participants (mainly international) worked independently with their own facilitators using the T-SEDA materials that were openly available online, and in some cases convening an introductory workshop too, with the option to use our team's materials.

The initial workshops (1–3 hours) run by the research team included self-auditing of dialogic practice, introductions to the basic theories of dialogic teaching and the T-SEDA pack itself, alongside a summary of the research findings from our large-scale study indicating which specific aspects of dialogue were associated with student learning gains. Hard copies of the resource pack were available to all participants for easy reference and sharing. Lesson video clips were used as a basis for practical workshop activities, including coding and discussion, for example, of strategies supporting student participation. Longer workshops also included exposure to techniques such as class-negotiated 'ground rules' (or 'talk rules': Mercer, 2019) for effective educational dialogue and equity in participation. All workshops included a period of individual inquiry planning by participants, including selecting T-SEDA resources, with the support of members of the research team. Distance support was available throughout the study period via email (albeit rarely requested), including timescale reminders. Final workshops concluded the study for some teachers within geographical reach. Some participants presented completed inquiries and conclusions were discussed collectively. In most locations, though, workshops (varying in number and duration) took place independently of the research team. All participants were encouraged to submit short final reports on their inquiries, using a template required.

The research complied with the British Education Research Association (BERA) Ethical Guidelines for Educational Research (2018). In awareness of the considerable demands on practitioners, some funds were made available to release participants for workshop attendance and additional involvement such as interviewing, although only a small proportion of participants were able to benefit. In three cases (England, Hong Kong, New Zealand), facilitators sought local funding to support inquiry activities, for example for teacher release or transcription. Written, informed consent was obtained from all participants. Some facilitators submitted their own ethical approval proposals within their institutions before commencing the work. All participants were clearly informed in writing of the ways that data would be securely stored, protected and shared, in accordance with EU GDPR (2018) legislation. In this paper, facilitators and their organisations are named with their permission (except where this would

identify the authors, when a pseudonym is used). Finally, we were mindful of the question of whether teachers themselves gain from being involved in potentially time-consuming studies and, if so, how. In this case, participation was entirely voluntary and T-SEDA is built on the principle of practitioner autonomy in selecting their own inquiry foci, methods and material resources to be relevant to their own concerns rather than having an externally imposed research agenda.

Data analysis

Data sources available for this analysis (in English and Spanish where applicable) included:

- 62 pre-inquiry online surveys (Survey 1) and 42 follow-up surveys (Survey 2: with ratings and open text responses) designed to solicit demographic information and feedback;
- 45 participants' inquiry reports representing 50 teachers
- post-study semi-structured interviews with (11 of the 12) local facilitators conducted by the research team about their experiences of the T-SEDA initiative and the factors influencing impact on participating educators.

Note that 30 practitioners completed both a report and the second survey, thus 12 completed only the survey and 20 only submitted reports. See also Attrition section below.

The full set of qualitative data was analysed thematically by research assistants not involved in the data collection or programme design, aiming to minimise bias. They systematically searched for and coded sections of interview transcripts, open survey question responses and written reports seen as relevant to answering the research questions, including counter-examples (Braun and Clarke, 2013). Some of this process was deductive. For instance, to understand why individual practitioners engaged or disengaged, the inquiry reports and survey responses were examined for all that was said about participants' goals and motivations. This resulted in a quantified list of reasons, sometimes multiple, from the whole group for embarking on T-SEDA inquiry. An inductive approach was used to summarise data from more open questions from some respondents, such as those explaining about their adaptations made in particular contexts.

In order to understand the organisational structures and circumstances supporting engagement with T-SEDA in different local settings, we turned to the survey data and the interviews with facilitators. The interviews were transcribed in 'intelligent verbatim' form, which removes hesitations, repetitions and ungrammatical or filler words to leave a lightly edited record of the conversation. The research team familiarised themselves with the interview transcripts, identifying specific issues held in common (e.g. local leadership) or differently, such as facilitators' varying aims, priorities and working conditions. This approach not only helped in categorising different local structures, it also provided new insight into the local facilitator role as a key factor that had not been built into the original design. It therefore prompted further analysis of this role. As a final step of quality assurance we conducted respondent validation by sharing early drafts of this paper with all facilitators and incorporated

their responses and corrections. The quantitative survey data were summarised descriptively using frequencies and percentages, as the sub-groups of responses were too small and variable for further inferential analysis. We are aware that all of the project data are skewed towards sustained and thus more positive experiences of T-SEDA use. Others had dropped out for different reasons, so we lack more critical data (see next section). Our analysis of participants' perceptions and views is therefore inevitably selective and contextual.

Findings

Participant motivation and attrition

This section addresses RQ1, considering how individual practitioners engage with and disengage from T-SEDA inquiry in their various practice contexts. Data are derived primarily from surveys and reports.

Participants' diverse purposes and types of inquiry. Teachers worked at different paces during the study period. The durations of inquiry projects reported by survey respondents ranged from less than 2 weeks (17%) to 2–4 weeks (31%), 5–8 weeks (14%), and more than 8 weeks (38%) in different contexts. In several settings, inquiries continued into the following academic year and some are ongoing at the time of writing (including in Hong Kong, New Zealand and England). Almost half of teachers (46%) spent less than two hours per week on their inquiries, with a further 21% reporting time spent as half a day and an impressive 33% spent one day per week or more).

The reasons (sometimes multiple) given in the 43 participants' reports that mentioned motivation for trying out T-SEDA materials included a generic objective of improving the quality of classroom dialogue (35%) and also focused particularly on student participation:

- promoting more participation in classroom dialogue from students (19%);
- encouraging students to be more autonomous in their participation (21%);
- supporting the participation of quieter students (19%);
- evaluating students' participation in dialogue (44%);
- evaluating the impact of dialogue on students' learning (e.g. reading or writing) (16%).

The freedom of teachers to follow their own concerns was evident within one primary school in England, where teachers' individual inquiry questions included the following wide-ranging examples:

> What strategies could be used to increase the frequency of contributions from quieter children during whole-class discussion? (Year 5: age 9–10)

> In what ways do children respectfully challenge or question each other's ideas in the context of Philosophy for Children (P4C) discussions? (Year 3: age 7–8)

Table 1. Summary of practitioner participants and facilitators

Model of practitioner- directed inquiry	Setting	Summary of active participants (number and sector)	Facilitator
a) Professional inquiry for individual teachers or small groups, self-initiated (n = 4 in 2 institutions)	Further education college (ages 16–19), East Anglia, England	1 college lecturer	N/A
	Primary school, Essex, England	3 Primary teachers	N/A
b) In-house teacher professional development, initiated by school-leadership (n = 25 in 5 schools)	Primary school, East Anglia, England	4 Primary teachers	Deputy Head teacher (Hannah)
	University primary school, East Anglia, England	3 Early years teachers 9 Primary teachers	Deputy Head/ teacher (also a participant) (Liam)
	2 secondary schools in cluster, Lancashire	2 Secondary teachers: 1 in each school	Director of Literacy (also a participant) (Kara)
	Private all-ages school, Pakistan	2 Early years teacher 4 Primary teachers (one of them was also a secondary phase teacher and two of them were subject leaders) 1 Teaching assistant	Principal (Uzma)
c) School network professional development, bringing together teachers from different schools, initiated by local facilitator (n = 20 in 7 schools)	2 federated Islamic primary schools, London and Berkshire, England	8 Early years teachers 6 Primary teachers 1 Head teacher	Executive head teacher and T-SEDA team member (Farah)
	5 schools in school network, London, England	5 Primary teachers	Network director/PD coordinator (Sarah)
d) In-service teacher professional development, initiated by university (n = 11 in 3 schools)	1 primary school linked to university, New Zealand	3 Primary teachers	HE lecturer in education (teacher educator)[a] (Jane)
	2 primary schools linked to university, Spain	1 Early years teacher 6 Primary teachers 1 Subject leader	HE lecturer in education (Rocio)
e) Professional development for lecturers, initiated by university teacher educator team (n = 6 in 1 HE institution)	University, Hong Kong	6 Higher education lecturers	HE lecturer/course leader in learning science (also a participant) (Carol)

Table 1. (Continued)

Model of practitioner- directed inquiry	Setting	Summary of active participants (number and sector)	Facilitator
f) Professional development for lecturers, initiated by higher education professional development coordinator (n = 8 in 2 HE institutions)	University, Mexico	5 Higher education lecturers	2 HE lecturers in management (1 was also a participant) (Flora and Yolanda)
	University, South of England	3 Higher education lecturers	PD coordinator in department of HE (Marion)

[a] This facilitator worked with two colleagues to plan support for the inquiries, although she was the only facilitator who interacted with the teachers.

> How are children using dialogue in a playful context? Are aspects of Building/Challenging/Guiding evident in their organic dialogue? How can we further promote dialogue? (Reception: age 4–5)

Adaptations and innovations. Most teachers (77%) said that they did not substantially adapt any of the pack contents. However, the remaining participants said that they had created new resources, or adopted related third-party materials, to support dialogue. These included flash cards, group work 'role' cards, video, picture prompts, wall displays, and other visual aids, and, most commonly, sentence stems (on printed cue cards etc.) for the children and themselves using and adding to terminology in the T-SEDA codes section. Examples include:

> I used some additional visuals to support expectations for dialogue and discussion in the class—these were displayed on the wall. I also made some sentence stems as a point of reference for me to encourage me to ask questions that would encourage more dialogue: 'I wonder why that...', 'I wonder what would happen if...', 'It reminds me of...', ... these were modelled with the children.

Some teachers went further in creating new systems of communication to support and embed dialogue after the study. For instance, in the year following, one primary teacher in New Zealand sourced and introduced a sign language to go with the talk moves to enable the children in his new class to learn more quickly and include those who might not otherwise have joined in.

It is remarkable that those conducting inquiries in the three HE contexts considered that very little adaptation was needed for the T-SEDA resources. In Surrey, a minor adaptation was made to the original workshop Powerpoint; in Hong Kong, the materials were used as is; in Mexico, the local facilitator adjusted the language of the Spanish T-SEDA pack, especially with regard to references to teachers and children (versus lecturers and students).

Wider dissemination and future impact. We were interested to see how the T-SEDA approach may have extended beyond the teachers directly involved, promoting local knowledge sharing. Of the 20 respondents to a related survey item, 15 responded affirmatively. For instance, the institution in Pakistan planned to implement 'at least two dialogic teaching lessons per week for every subject to increase the involvement of the students'.

> Specific parts of my study, around modelling spoken language and narrative have already been reported to our support staff at a teaching assistants meeting. (Teacher in England, Survey 2)

> My findings are reported to my colleagues through regular staff meetings and CPD opportunities. Together with my work on effective and immediate feedback, the inquiry has had a school-wide impact on teaching methods, children's engagement and their progress. (Teacher in England, Survey 2)

It should be noted, however, that plans to follow up could be disrupted owing to extraneous circumstances. We heard from one school facilitator 9 months later that her plans were affected significantly when the school leadership team changed.

Attrition. Our total original sample was 166 practitioners who completed the initial survey (n=154) or otherwise demonstrated interest (n=12). In some cases, participants attended an initial workshop with enthusiasm and did not go much further, although they may still have reaped some benefit according to one HE facilitator, Marion:

> Some have engaged more than others, and that is not through lack of interest because when I did the intro workshop, people wanted to talk and talk and talk. It was absolutely brilliant. [. . .] But, you know, as it is in schools, you're asking for people's time and it's really difficult. But just that intro session stimulated a lot of thinking. So even if people haven't actually carried out the full cycle, I think that that in itself will have made quite a difference to the way people perceive classroom talk.

A number of educators completed the initial survey only and then dropped out of contact; Figure 3 depicts the distribution. One whole primary school in London withdrew after 5 teachers completed the survey, and a secondary school in Lancashire withdrew after 9 teachers completed it. In addition, small groups of 2–3 teachers withdrew from some schools where larger numbers of staff had enrolled and most had continued with the involvement.

It is difficult to know the reasons in many cases, but since the attrition rate was high, careful attempts were made to shed light on these. A follow-up email query and information from colleagues in direct contact with our team revealed that there were generally compelling reasons where any reasons were forthcoming. At least eight teachers had left their schools, one went on maternity leave and one had reduced her teaching hours. One workshop attendee was a newly qualified teacher who found it hard to carve out enough time. In the London network, three people dropped out from the same school because their school decided to focus on a different area of research. Two teachers from another London school dropped out saying they were not available to attend the next two workshops and therefore felt they could not

commit to the project. Three HE lecturers had insufficient spare time owing to competing workload demands.

It should also be pointed out that we asked potential participants to complete the survey *before* accessing any of the materials wherever possible, so as to obtain an 'uncontaminated' picture of their baseline understanding and use of classroom dialogue. It may be that once they viewed the resources, some considered these were not what they had expected or would find useful (although we have no evidence for this). It is also the case that individuals without support of a local facilitator, especially those remotely located, were more likely not to proceed (those in this category included teachers in Brunei, Canada, Greece and Saudi Arabia as well as England), while only one individual and a group of three persevered. Perhaps the drop-outs required a greater level of human support than they were offered. If so, this reinforces the positive role of a local facilitator for scheduling regular meetings that both offer peer support and place an expectation for continued activity and reporting by busy practitioners who are juggling competing priorities. The low level of prescription in the materials may not suit all teachers. For example, one New Zealand participant found the approach's lack of prescription challenging and wanted more help developing student-friendly talk stems and in planning. Nevertheless she completed an in-depth inquiry lasting two semesters.

It is also notable that dropout was proportionally higher among secondary teachers who can be spread out across subject departments, thus perhaps losing collective momentum. One secondary school who had a keen facilitator and attended our initial workshop wanted more support than we could offer and experienced challenges in scheduling workshops themselves; inquiries never got off the ground there. In contrast, teams that are closer knit (e.g. primary school staff and the HE teaching teams) may have naturally been more collaborative and focused on shared goals. Certainly there were far more primary school participants. One secondary facilitator—who conducted her own inquiry but whose two colleagues did not report back to us—attributed reluctance to participate and attrition in this context to the perception of

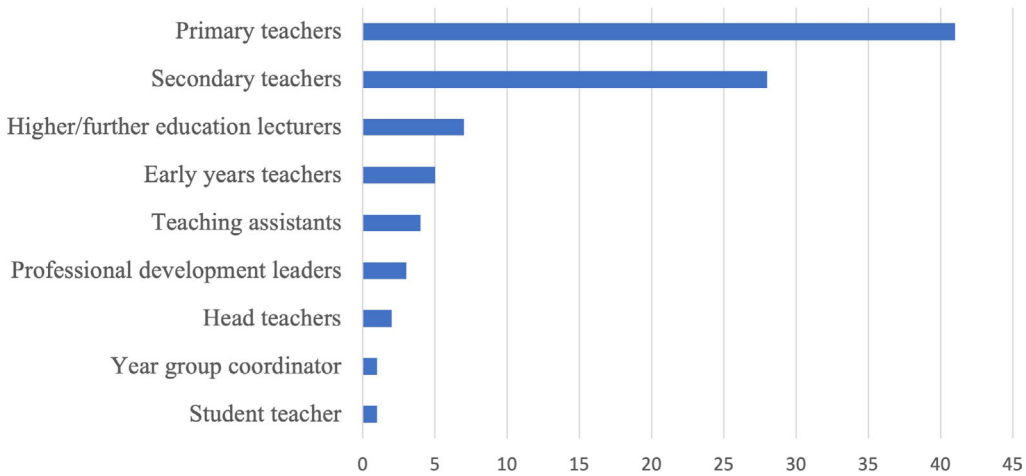

Figure 3. Drop-outs after initial survey

excessive workload involved in an inquiry. However, this was not her experience; instead it proved an enjoyable and efficient way to increase students' use of dialogue. She planned to use the lessons learned to encourage more colleagues to take part next year; she felt in a stronger position to facilitate others' inquiries and to reduce the likelihood of future attrition by applying her local knowledge and support. In addition, the short timescale of the funded 1-year impact study called for reporting on inquiries within a relatively short window of opportunity that did not always fit well with the yearly planning cycle in school and colleges, and may have been another factor in attrition. In sum, a proportion of volunteers for any educational initiative will not continue or complete the activities, owing to the realities of institutional demands, and likelihood of perseverance seems to be related to the level of support they can obtain from colleagues.

In order to explore whether participant motivation to conduct an inquiry might be related to (i) prior experience of professional development (PD) on classroom talk, dialogue or collaborative learning or (ii) prior understanding of dialogue, we examined the relationship between these factors and withdrawal versus continuation.

(1) Around 52% of the 141 Survey 1 respondents in our study who answered the question had previously undertaken related PD. There was only a small difference in withdrawals after the survey in relation to this: 51% of the 81 teachers that withdrew indicated not having previous PD in this area compared to 45% of the 60 active participants who completed the survey. Likewise, there was little difference in durations of the PD that active participants and drop-outs had experienced.
(2) Figure 4 portrays the ratings of participants' initial understandings of dialogue by the active participants and those who withdrew. Ratings were derived from a 3-point scale employed in a previous related study (Hennessy *et al.*, 2018; see rating scale in Appendix S2). In both groups, around half were unable to give any description of (i) the differences between dialogue and other forms of talk (frequencies here were too low to test for differences between distributions) and (ii) the features of a dialogic classroom (Figure 5; the distributions were similar to those for (i) and not statistically different for participants and dropouts (χ^2 (3, 154) = 6.38, p = 0.094), although weaker understanding and lack of response were more common in the dropouts.

A bigger difference emerged, however, in (iii) the ratings of respondents' practical examples of recent dialogic activities in their lessons. Figure 6 shows that about half of the teachers' responses in both groups demonstrated weak understanding. For the active teachers, though, the second most common rating was medium understanding (24%) followed by strong understanding (19%). Only 6% were unable to provide any examples. For the teachers that withdrew, far more (26%) were unable to provide examples, 11% demonstrated medium understanding and only 9% showed strong understanding. This time, the difference between the distributions was statistically significant (χ^2 (3, 154) = 15.28, p = 0.0016), suggesting some correspondence between initial familiarity with classroom dialogue in practice and readiness to conduct systematic inquiry. There is thus some evidence that our sample of participants was somewhat skewed towards those with stronger

initial understandings of dialogue, which may have motivated them to persist with inquiries.

Professional inquiry contexts and structures

This section addresses RQ2, identifying the variety of organisational structures and circumstances of engagement in inquiry emerging across the different educational settings given the non-prescriptive nature of the process. Data derived from surveys, facilitator interviews and reports.

Organisational structures of inquiry. The success of the flexible design of the T-SEDA programme was evident in the readiness of those in a range of contexts to devise their own tailored professional learning approaches. The ways of working differed on these key dimensions:

- initiation by local leaders or directly by individual or groups of practitioners;
- educational level (school, pre-service, in-service, lecturers);
- scope (individuals, institution, school network, university-school partnership);
- structure and degree of formality (course with accreditation, professional development initiatives [unaccredited], other informal kinds of inquiry).

Most participants who responded to the survey said that they worked individually on their inquiries or with other colleagues, although other partners were mentioned too (see Figure 7 for distribution).

Examples of these collaborations included peer observation and discussion of a lesson, and joint planning of an inquiry.

From Survey 2 together with further interview evidence with participants and local facilitators we identified a range of six distinct organisational structures for inquiries (a–f), as summarised in Column 1 of Table 1.

A further two approaches emerged in Israel in the wider programme beyond the study. Data were in Hebrew and have not been analysed nor included in the findings below, but the structures of engagement are included here in order to illustrate the full range:

g. University-based pre-service teachers' initial training course, initiated by university lecturer/researcher (n = 30)

h. Professional development course for in-service teachers in a HE setting, initiated by university lecturer/researcher (n = 25, then working with around 100 colleagues in their schools and subsequently, one nationally designated 'Leading Teacher' working with teachers in two other high schools (n = 15). A further 55 secondary teachers came on board in 2019–21, adopting a whole-school approach involving weekly meetings led by the school leaders.

It is striking that the emerging professional development approaches and successful pathways to impact all involved coordination and input from a local facilitator with minimal external support, apart from one lone teacher and a group of three colleagues

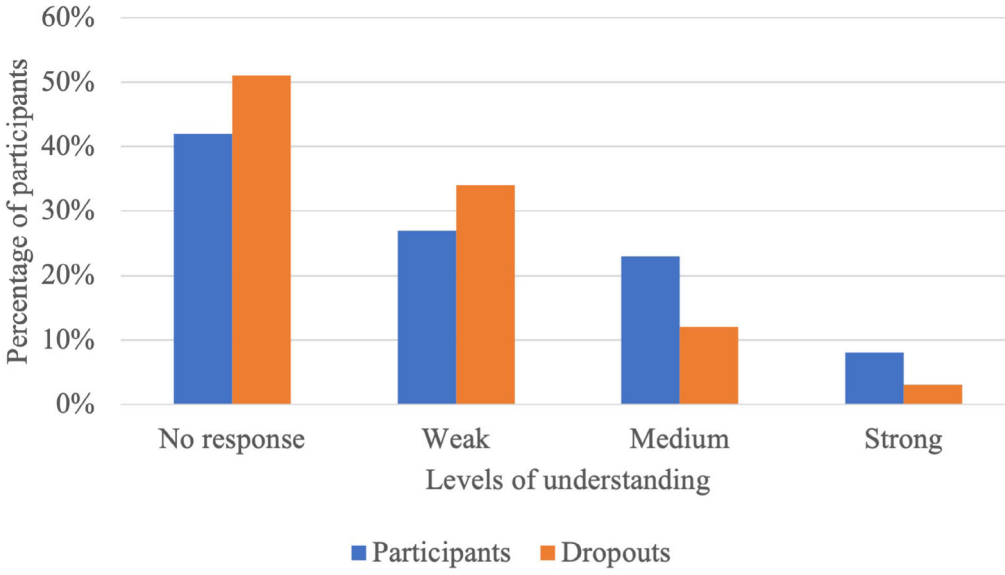

Figure 4. Levels of understanding of the notion of dialogue

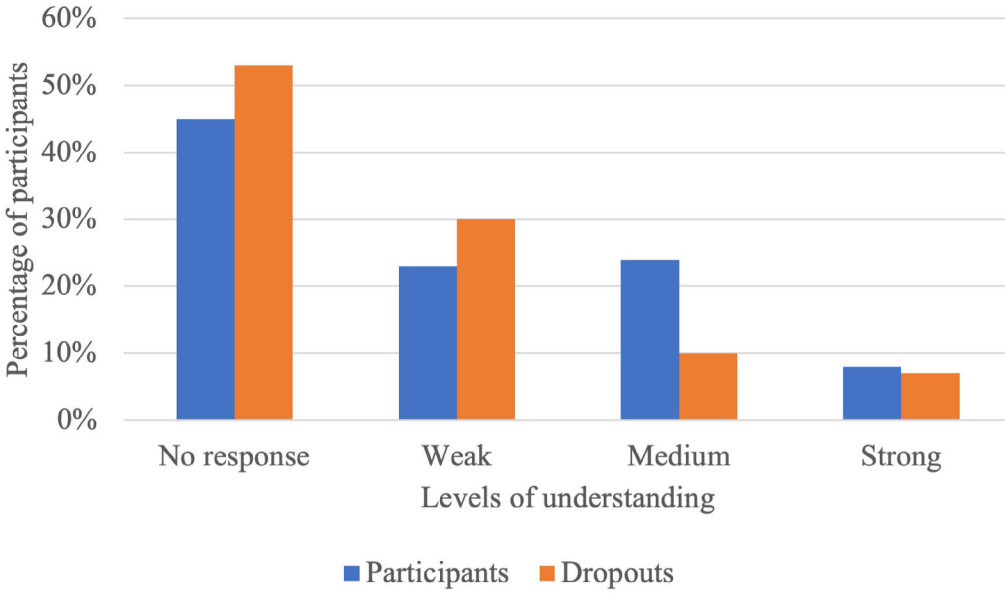

Figure 5. Levels of understanding of features of a 'dialogic classroom'

(two settings: Model a). The pivotal role of local support was explicitly mentioned by 9 of the 11 facilitators interviewed, with no dissension). Jane made a stronger case than others:

> I can't imagine our project would have worked without facilitation driving it. I think it needs a driver. I think New Zealand teachers, and other English teachers too are just incredibly busy people. I suppose they could do a much scaled-down version of something —they could do, because teachers in New Zealand are required to do cycles of inquiry into

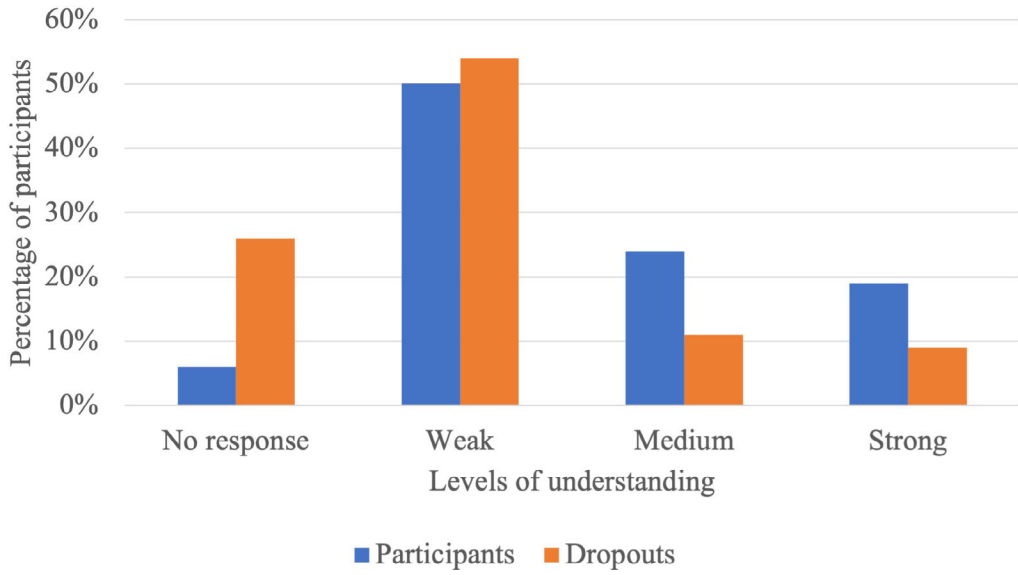

Figure 6. Levels of understanding related to concrete examples of dialogic activities

their own practice as part of the school appraisal system and it's in the New Zealand curriculum.

It was notable too that 37% of participants responding to the initial survey held a leadership role, either in addition to their classroom teaching (such as a subject leader) or as a member of a school leadership team. The single teacher who worked alone went on to enlist and work with colleagues, bringing two to our final workshop. The high level of leadership role-holders could account for the emergence of local facilitators as a model for uptake. Indeed *all* 12 local facilitators held a leadership role of some kind: see details in Table 1, which also shows that the facilitators engaged

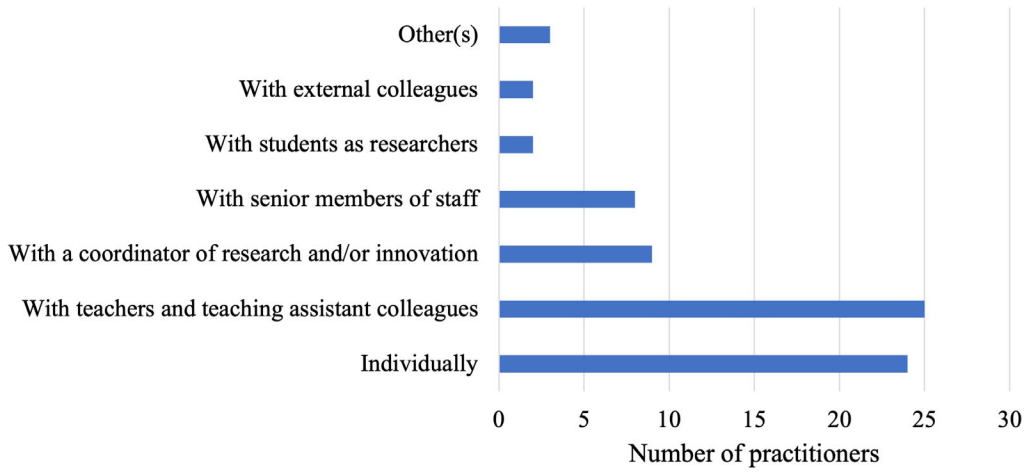

Figure 7. Frequencies for survey respondents in each mode of T-SEDA inquiry

colleagues either within one institution (n = 40 participants in 8 cases) or across several (n = 30 in 4 cases). They often used the T-SEDA resources as part of an established programme of professional development/inquiry or school improvement activities, or as a focal point for oracy development. As alluded to above, this is potentially due to an increasing political emphasis on research-informed teaching in some countries, such as the UK, New Zealand and Israel. This is eloquently summarised by the South London Teaching Schools Alliance (SLTSA) which asserts that 'engaging with research evidence as part of an enquiry into teachers' own practice bridges the "implementation gap", or the gap between knowing something could make a difference to learning and understanding the implications for classroom practice'. See Box 1 for more details of the SLTSA inquiry approach.

Another facilitator in England (Hannah) told us that the research-practice divide is potentially closing:

> I think that there is almost... a fad for research-based strategies in education at the moment: everyone is saying, 'Is it research-based?' and that is becoming more of a question to ask when you are implementing new strategies: 'Well, what is the research behind it?'

Facilitators' ways of working. Local research leaders and facilitators worked in different ways in their contexts, all of which proved pivotal in terms of enhancing impact. They worked largely autonomously and were proactive in arranging professional learning activities (workshops) in their own settings, often without prior consultation with our team. Some collaborative groups and networks participated in workshops led by ourselves on our university site or in a host institution (face-to-face in the UK and online with Mexican and Pakistani colleagues). The typical approach was for participants to convene regularly as a group with their facilitator for peer discussion of the outcomes of their individual inquiries. Facilitator support commonly included leading participants in selecting their inquiry focus and planning the activity/lesson, and advising on recording of data and interpretation of results. Box 2 offers an example of facilitation in a higher education setting.

In a couple of cases, facilitator feedback was instead individual. In one English school this led to a teacher's sense of isolation:

> The sharing is actually massively important towards teachers then having ideas to go and experiment with...when people get a chance to observe each other, I think that is really, really powerful.

> I think what would have been good...would be just to say once every half term let's get together and just talk about where are we? What's the next steps? ... you need someone to bounce ideas off a little bit I think, and also someone who says 'oh, you could do it like this' and give you new ideas, to sort of keep it fresh and to sort of move you onto the next part...I think that would be really helpful... to see what other people are doing and say 'oh I like that' or 'I'm not sure that would work with my class.' ... because otherwise you're in a bubble.

In Spain the facilitator (Rocio) worked with individuals in two schools. In each, she conducted an initial joint workshop followed by four meetings and she set up a

Box 1

School network professional development

The South London Teaching School Alliance comprised a group of primary schools in two London boroughs. The T-SEDA team was approached by the Director, Sarah Seleznyov, who wished to develop a year-long PD programme. She gained additional funding for teacher release to attend a series of six workshop sessions during the academic year 2018–19 culminating in a day conference, and incorporating the T-SEDA workshops in this process. Teachers were recruited to conduct a range of inquiries around the common theme of dialogue, at the instigation of their head teachers. The network approach highlighted substantial impact on classroom practice in the context of school development priorities, and sustained, systematic inquiry, as one relayed:

> Over the course of this academic year, I have routinely returned to my initial focus of inquiry to check the health of my investigation and ensure I was keeping the questioning and subsequent observations relevant.

This teacher then planned specific 'next steps' for her own school and the others, to embed dialogic teaching more widely and ensure appropriate staff development for teachers and support to progress into the future.

WhatsApp group for each school. The structure seemed to work well in this case, and the quotes from the Spanish facilitator in the next section offer some insights as to how and why this was. In the absence of local facilitation one practitioner who worked alone nevertheless benefited from existing mentoring structures in her further education college. She received feedback from her line manager who pointed out after a lesson observation that her dialogic teaching was focusing on the most able and confident students. This led her to attend more closely to those '. . .who refused to talk at all'. This prompt helped to shift her inquiry focus and extended her understanding of listening as a valuable part of dialogue:

> . . . there was let's say a third of the class normally, on average, depending on the class, who were not interested in talking. However, my point to defend this position was that they're still listening. They're still listening to our classroom feedback or classroom plenary, and they're learning from this.

All facilitators had to decide when and how to offer support; they recognised different support needs and thus offered varying levels of support (see also Section Strategic and flexible planning for stages of support and 'scaffolding' under 'Factors underlying successful facilitation' below). While the number of meetings varied, it was an average of 3–4. The head teacher facilitator in Pakistan involved herself in helping the teachers to analyse their lessons in detail and held initial self-audit individual meetings to support them. She held 3–4 individual meetings at every stage, and gave teachers support in writing up results accurately in their reports. She commented that it is 'good to be hands on, to ensure something to be part of school culture'. Likewise, Flora,

Box 2

Professional development for higher education lecturers

Professor Carol Chan of Hong Kong University who attended a T-SEDA workshop in October 2017 (she was already familiar with dialogic teaching and collaborating with us on integrating it into knowledge building) has adopted the approach in her own lecturing practice and inducted five fellow teacher educators who also joined the study; all six are now working with their Postgraduate Diploma in Education students across all levels from early years to secondary. Carol and some of her colleagues successfully applied for internal funding to support measurement of impact on teachers' practices and the 120 students in their classes, and factors influencing changes. Six (video-recorded) workshops took place. These included: (1) introduction to the materials; (2) discussion of T-SEDA coding framework and comparison of different schemes including the well-established Accountable Talk scheme developed at University of Pittsburgh; (3) sharing by the facilitator of video footage of her own practice; (4) sharing of video clips by three further colleagues and discussion on dialogic teaching. The team also used an online platform that one of them had devised (Classroom Discourse Analyzer: Chen *et al.,* 2015) to code use of T-SEDA dialogue moves. Student questionnaires demonstrated positive views.

facilitating a HE group in Mexico, assisted individual planning, video recording and analysis. However, in contrast, a primary senior leader in a different school (Luke) took a more relaxed approach, noting that being a facilitator did not require much time directly with individual teachers.

Another primary senior leader (Hannah) also saw T-SEDA as an opportunity to support her teachers' independence, since a dialogic approach was already more established in that context:

> . . .as a teacher they need to be able to develop their own learning and take things on for themselves, because otherwise they're not really going to be lifelong learners and be good learners. If I'm having to say 'no, you need to do this, now you need to do this', they're not learning anything.

The need for a balance was summarised by Farah's description of the main facets of her role:

> One to equip teachers from a distance and let them work with something themselves so that they take it on board and they become fairly autonomous in how they handle that. But the second is to also give a structured framework whereby they can see a project develop over a bit of time, and in doing that you kind of have to have these set times factored into their work schedule, factored into the school timetable to support that to happen.

Factors underlying successful facilitation. Our analysis of locally emerging facilitator models (from interview and survey data) helped to identify some distinctively promising factors and processes, as follows.

Facilitator familiarity with dialogic principles and practice—In nine cases the references to research evidence in the T-SEDA pack chimed with facilitators' own knowledge of the field of dialogic pedagogy and belief in its importance: Sarah was 'a big believer in dialogic teaching' and Uzma 'wanted to be heavily involved in it because I can see the benefits of this approach and so I made time for it'. Jane told us:

> I had for many years taught a session on classroom dialogue, and it's quite practical. I teach it across the Master's and the undergrad degree, and it's just always really strongly resonated with our students. They've always really engaged with it richly. They can see how becoming more sophisticated in dialogue has got great (results) for themselves and the students whom they teach. So that's always (kind of sparked their interest).

Marion likewise stressed the need for proof of concept:

> I think that once teachers realise the power of just changing the way you maybe ask questions, or changing the way that students ask questions, it could be really quite a wow moment.

One co-facilitator in Mexico (Yolanda) was unfamiliar with dialogic techniques to start with (although she did conduct regular reflective inquiry) and was motivated to learn more. She noted that a teacher may only be able to 'systematise' dialogic pedagogy when they have reached a certain stage of professional knowledge, practice and experience, estimated to be after about 3 years. Another (Carol) highlighted her role in offering mentorship around the underlying principles.

Overall, local facilitators valued working with high-quality materials for teachers to use and adapt in their own diverse contexts. They saw the T-SEDA approach and materials as a specific opportunity to be grasped, amongst a myriad of available professional development offers and resources. Facilitators unanimously concurred that T-SEDA offered effective bridging between research on dialogue and classroom practice. The facilitator in Spain additionally outlined the mutual benefits for teachers and facilitators who themselves are academic researchers:

> Unfortunately our teacher training programmes are not informed by research, hardly at all... so the T-SEDA makes a contribution in that way. Because it's research-informed, because it's facilitated by us, I think that's important that it should be the researchers bringing the tool to the schools and engaging in the conversation because that informs our research.... You need to know the reality you are analysing and you are studying, so I think this tool establishes a bridge between the research we do in that we have an understanding of the role of dialogue for education in a deeper way, from a different perspective, [through] establishing a dialogue with the teachers. [Whereas] if your approach is monopolising the expert knowledge, it is very unlikely that they are going to be engaged.

The one teacher to work entirely alone noted that she 'already had the belief that collaborative learning is really important at any stage of schooling, so I already had some background knowledge by reading some academic papers on these questions'. However she also mentioned that she would probably have benefitted from 'more in-depth meeting with some colleagues at the Faculty of Education'.

Personal and professional motivations—A key motivation was that, as mentioned above, all of the facilitators had a pre-existing degree of designated leadership

responsibility in their own context. This allowed them to justify the time required to plan the project, adapt materials and offer ongoing support and mentoring as required. Their roles included responsibility for:

- PD in a HE context ($n = 3$);
- middle or senior school leadership ($n = 5$);
- research leadership in HE ($n = 3$);
- research leadership for school network ($n = 1$).

They all prioritised the T-SEDA approach and linked it to their existing (varied but sometimes overlapping) foci on PD, research, improving practice, or teacher learning and agency. For instance, Marion told us:

> We are responsible for teaching quality in the university, so that is my job, to work with lecturers anyway. So I work with them in a PD capacity. [. . .] I didn't have to step out of my role to set this up.

Seven facilitators spoke mainly about practitioner development with more implicit connections to institutional agendas, while four expressed an institutional development focus as well. They mentioned the benefits of an accountability mechanism, asserting the need for leadership of practitioner uptake of the pack because of time commitments and competing priorities. In two cases, T-SEDA was integrated into professional learning with accreditation and inquiry was linked to formal appraisal in a third.

The head teacher facilitator in Pakistan, Uzma, perceived T-SEDA as an opportunity to challenge traditional teaching methodologies in her school, where typically:

> The teacher leads the lesson, she conducts the lesson and she makes the children do the work. I wanted to build thinking skills up. I wanted to build creativity in the children, so I thought the methodology was good to take the school in the direction that I want to take it.

Eight facilitators had known contact with or knowledge of University of Cambridge research on dialogue, although not all spoke about this explicitly. Two of them articulated a school-university partnership perspective of some sort; for the others the link probably served only to inform them of the study.

Leadership responsibility along with the rationale in the preceding subsection concerning pre-existing familiarity with dialogic pedagogy—the two most common rationales mentioned for supporting teachers' uses of T-SEDA—were evident in the explanation offered by one English primary deputy head teacher (Hannah). She had noticed 'low speaking and listening levels' that needed addressing:

> From my observations of practice across school, I had identified that it was an area where there was probably too much teacher talk in school and not enough of pupils being given the opportunity to talk. So, we have talked about it in staff meetings and things, but not specifically, and then I got the sheet about the (T-SEDA) project and I was like 'ok, this sounds like a good way of at least opening up that conversation and getting some people to start developing their practice so that other people can come on board'.

Hannah also reported that participation in the programme 'raised the profile across the school and. . .linked with other areas of development like critical thinking that we are thinking about anyway'. It was notable that in contrast with the teachers, none of

the other facilitators mentioned improving student learning outcomes as a rationale, although it may have been implicit in some cases, with participation being equated with learning.

Facilitator motivations included engaging in learning alongside participants (Calcagni, 2020) and developing their own skills. Four facilitators (Carol, Kara, Luke, Yolanda) conducted inquiries into their own practice. For instance, the secondary school participant in Lancashire (Kara) stated that conducting her own T-SEDA inquiry had both improved her teaching practice and given her tools for her role of Director of Literacy (which included oracy) within school. Similarly, in the Mexican HE context Yolanda developed her own skills in dialogue coding and then felt in a position to understand what she could expect from her students in their contributions to dialogic participation and inquiry. She was new to dialogic teaching strategies and considered that it would be useful to learn about them, carry out a self-evaluation and to improve her practice using the T-SEDA tools. Her co-facilitator Flora reported that she inspired colleagues to participate: 'the teachers trust Yolanda and when she decides to use these strategies, everyone engages in it'.

In some cases, then, facilitators perceived opportunities to tie in with their existing work and potentially enhance it. This is nicely illustrated by the Hong Kong facilitator in an HE context, who holds a particular research interest in the connections between dialogue and student knowledge building:

> I also wanted to look at how could dialogue take place for knowledge building, for people to build more understanding. It links up with some of the things that I've been doing for decades. [. . .] Now I kind of think that the creation of a dialogic learning environment can enrich students to build on others' ideas, to elaborate, to give reason, to explain, this is all knowledge building but it is a much easier entry point for many teachers! That's also why the connection with you is very attractive to me, both from a theoretical and also from a pragmatic perspective . . . We can start with ourselves as teacher educators.

Strategic and flexible planning for stages of support and 'scaffolding'—A recurring theme was that a local facilitator helps to develop ideas collaboratively, especially through face-to-face interaction and scaffolding development of new approaches. Specific roles mentioned included creating structure, providing materials, and organising meetings and other spaces for discussion and collaboration. Support was deemed particularly important in the initial stage. Flora, facilitator in the Mexican HEI, described her scaffolding role as explaining dialogic teaching at the start and helping participants to make connections between their practice and the strategies and materials in T-SEDA; then holding informal meetings to discuss participants' doubts or questions about the materials, then guiding them to choose the materials that would be most useful and completing some of these templates with them. The facilitator supported participants in carrying out video recordings too.

The facilitator in Spain described her complex scaffolding role partly in terms of being a sounding board within a respectful relationship, as follows:

> My role as I understood was providing them with a resource and engaging in a dialogue, in a conversation about making decisions, being myself not directly instructional in terms of saying 'this has to be done in that way' and being more open in the discussion. I think that

> put them in a position where they need to be active and be agents and think carefully about it . . . I think they felt reassured by me being there [. . .] I was, I would say, just a facilitator, an equal colleague in that way giving the space for them to make decisions and scaffold or guide them when needed, and building on those trusting relationships as well.

She concluded that providing more detailed explanation of the observation templates in the initial session (akin to the initial workshops we ran for some groups) was important to ensure clear understanding from the start.

> You know, I think in my case I assumed they would read that with that, but they didn't, so I think I should have been a little bit slower in terms of 'this is what this is about.'

The importance of managing initial stages of engagement with T-SEDA inquiry was noted by others too. For instance, the facilitator in the Lancashire secondary school context considered the initial face-to-face workshop experience to be more helpful than reading materials for securing 'buy-in' from colleagues. Likewise, the facilitator in Mexico explained that the first obstacle was to '*break the inertia*', meaning that participants have to abandon their routines and usual, potentially long-established, ways of carrying out their practice. Establishing teachers' initial commitment with effective communication about the programme (and devising a timetable) at the first workshop was seen to be essential.

Luke, facilitator at the University Primary School, explained how he used the T-SEDA materials at his first workshop, supporting coding practice and linking dialogue to the school's existing focus on play-based learning.

> The first session really set up the methodology of choosing a focus and [looking at] how do you code the dialogue? . . .At the staff meeting . . . we had half of the staff observe and half of the staff have a discussion around a prompt to do with the dialogue. [. . .] 'How does the content of the film relate to your own practice, and then how does it relate to the school?' or something like that. And then, so the other teachers had just a bit of practice to use the coding system and we used a more simplified version and then a more detailed version, and reflected on what were the easy bits and what was more challenging, and swapped over for the second bit so that everyone had a chance to practise [. . .] But also the other appendix sheet where you can just have a more live observation format and a sort of simplified version. So I think that's a really important sort of tool that teachers can have in their toolkit, and probably they're new, and because we are also looking into effective play for inquiry or playful learning, the dialogue and the cooperative learning, well that stuff really underpins. . . effective play.

Engaging with others in collaborative and complementary roles of research leadership and facilitation—Collaboration between facilitators was rare but a particularly interesting and valuable approach, observed in two HE settings. In Mexico one facilitator undertook specific support roles; she first adapted the framework before presenting the materials to the lecturers, then held informal meetings, as previously mentioned. The role of her co-facilitator, who had a more formal leadership role within the team, was to motivate the participants by pointing out the importance of the activities and suggest adaptations. This type of 'team' approach was also reportedly successful in Hong Kong where the main facilitator indicated that delegating responsibility and sharing facilitation of different parts of the programme with her lecturer colleagues boosted

ownership. It offered differing perspectives and helped to create a situation of trust and safety to try and challenge different pedagogical approaches. In Pakistan, the Early Years lead supported teachers at that level although she did not conduct her own inquiry. Finally, in Spain the facilitator visited schools with two doctoral students. These examples illustrate the ways in which local models can develop in a 'layered' way with different aspects of PD for participants and facilitators.

Challenges for facilitators. Tensions and challenges also emerged, however, for local leaders and facilitators who require the capacity, knowledge and resources to identify various practical and ethical issues concerning time demands and practitioner agency in their own contexts. There are specific needs for facilitators in handling these challenges, as follows.

Managing diverse needs, hopes and expectations; mitigation through leadership support— Coordinating the inquiry process sometimes entailed working with different groups, shifting attention and brokering between them, that is, facilitators worked in distinct ways with teacher participants; stakeholders such as local school leaders or others; and members of the T-SEDA research team. The latter raises the notion of accountability. A facilitator in HE (Flora) considered the formal status of the project (with support from a university team, including a formal letter of invitation and provision of consent forms) to be one supportive factor in motivating participants to use T-SEDA. A second facilitator in England (Hannah) pointed out that accountability was supported through the structure of needing to submit reports (or at least interim reports) to a third party. She also emphasised the importance of engaging in a research project compared to peer discussion alone. In her school the programme had inspired and influenced their staff reading group too:

> Some of the stuff, the dialogic talk that you talked about, actually has come up in some of our [school] reading sessions. . .. But I think it's that focus on that as a topic, and that as an important thing, that is raised by doing a research project, and that just reading it and talking about it in the staff meeting will not necessarily have the impact on practice.

The benefit of accountability additionally emerged in facilitators' argument that leadership is needed for teacher uptake because of competing priorities. This includes creating structure, providing materials, and organising meetings and other collaboration spaces.

A challenge related to working with different stakeholders was handling the sometimes conflicting demands on participants. This included using T-SEDA inquiries as part of formal appraisal requirements, as in the New Zealand school where this raised ethical issues since participants could not be construed as volunteers. Attendance of school leaders in initial workshops for monitoring purposes was ceased in order to make teachers feel more comfortable. Likewise if a whole school initiative required teachers to participate, it is unknown whether the outcomes would have been so successful.

An issue raised by one facilitator, Farah, was the need for participants to develop an identity as a practitioner-researcher and the difficulties that some found in considering their own teaching practice in a different way: developing an analytic or

'research stance' in the words of Stenhouse (1975, p. 156) namely, 'a disposition to examine one's own practice critically and systematically'. One of the primary school facilitators (Hannah) saw this in terms of teachers being 'natural experimenters', epitomised in T-SEDA inquiry (we have co-authored a book chapter on this topic with her and a case study teacher in her school: Kershner *et al.,* 2020a).

These potential tensions seemed to be reduced in settings where the importance of dialogic pedagogy or at least of teacher inquiry was already recognised for whole-school development. In such cases, involvement with T-SEDA was therefore linked to this existing agenda by participants. Importantly (from an ethical perspective), this was not usually compulsory, as one primary school facilitator in England (Hannah) explained:

> For example, in our history and geography one of the big things we're developing is [children's] asking of questions, their being able to find out the information, and really develop those skills of being historians and being geographers, and really developing the children's thinking within that rather than 'here's the information. Now we're going to regurgitate it.' So actually, some teachers have been working on [that, using T-SEDA].

Several facilitators perceived that a whole school approach, driven by the leadership team, would have been ideal for success, and this resonates with other previous and ongoing work in the area of professional development. Obligatory PD may generate strong buy-in if its purpose and benefits are clearly explained to participants (Timperley *et al.,* 2007). It seems likely to maximise sustainability in terms of motivating participants to remain engaged. It is rare, however, in dialogic teaching interventions, which far more often rely on volunteers. Indeed, only 4 of the 20 institutions in our sample attempted to involve all staff; in the University Primary School this appeared to be unproblematic although it was a special case, namely a research-intensive school already immersed in multiple pedagogical initiatives including regular lesson study. Nevertheless, explicit endorsement by school leaders could pave the way for increasing participation and success in embedding dialogic approaches (while minimising ethical concerns around coercion). Indeed, in Pakistan, T-SEDA inquiry was optional but recommended and encouraged by the head teacher as part of teachers' PD; take-up was high. Support is still needed. The South London network facilitator emphasised the importance of head teacher support and commitment[3] in her interview:

> It's been very powerful in the two schools that have done it whole school [but] where teachers have been nominated by their head teachers, and then left to [work on their own], that's not been great [. . .] a number of them have dropped out of the project, so my sense is that they didn't volunteer to take part.

The facilitator in Spain recommended building on the most engaged teachers and using them as successful examples (again, proof of concept) to support sustainability, in expanding towards a whole-school approach:

> With School 1, having a head teacher encouraging use of this for the whole school, that's fantastic because she saw the benefit on the teachers, on their reflection, making decisions, observations, deep critical views on making dialogue effective and so on. So I think in terms of sustainability we need to prove that this is useful, and this has an impact on the students. . . We need to be conscious and critical and concerned about how to measure that impact. So then, if we can prove that this has a positive impact on the students and on

> the teachers themselves and on the school, and building on the biggest success stories and replicating them, that would help others to embed it in their own practices, building on that and using it in a sustainable and scalable way.

This depicts a need for balancing a degree of participant autonomy with sufficient scheduled time and scaffolding as illustrated respectively by the quote from Farah under 'Facilitators' ways of working' and in the last excerpt in the Strategic and flexible planning for stages of support and 'scaffolding' section above from the interview with the Spanish facilitator.

Contextualising and translating materials for local accessibility and needs—Understanding local contexts, especially knowledge about students, assists facilitators in helping participants and addressing their concerns directly. This point applied across many school and HE contexts, including Hong Kong, Mexico and London. For instance, in the South London network some early years teachers needed personalised support; the facilitator suggested that dialogic teaching in early years settings needs very different kinds of adult input from what is suggested in the T-SEDA pack for older students. The university primary school facilitator (Luke) likewise mentioned that his early years colleagues found that the 'Challenge' category in the coding framework needed to be adapted for much younger children who have less sophisticated communication skills.

The process of contextualising the materials and the research findings underpinning them is of course not necessarily straightforward or simple, as five facilitators pointed out. In some cases facilitators had to adjust the language and other aspects of the T-SEDA materials to be relevant in different educational phases and contexts, thus taking on a 'translating' role to help participants digest the pack, make the abstract practical (Rocio, Flora, Carol), and to embed the approach in the school culture (Uzma). For instance, the facilitator in a HEI in southern England pointed out that participants new to a dialogic approach needed careful guidance in order to secure buy-in:

> I don't remember thinking that [the materials] needed to be graded in any way, I think they worked fine as they were. It's how they're presented I think. If you've got no understanding of classroom dialogue and you get the pack, I think it's overwhelming, so I think it needs to be presented very carefully at the beginning, and that's what I tried to do; I tried to make it accessible. (Marion)

Another facilitator (Sarah) was also unsure that teachers would understand how to develop their practice without a facilitator since the pack is quite long and information-rich and could thus be a bit confusing. Translation and communication was therefore one of the key facilitation roles. This is linked to the section Strategic and flexible planning for stages of support and 'scaffolding' above as well, where we outlined how facilitators considered that scaffolding was needed in the early stages in particular. Part of the facilitator role, according to Farah, was to help teachers understand the benefits and impact of using T-SEDA, again so that they buy into the approach. She argued that without a facilitator in place and an incentive to participate, there would in fact be 'a really small number of teachers who are motivated to do this themselves'. Hannah likewise considered that teacher buy-in and ownership

of the process would help reduce the need for continued support sessions that are unsustainable.

> Sharing adapted resources is really good for feeling a sense of shared ownership but first you need buy-in; the philosophy behind dialogic teaching is essential to creating long-term change. Rather than saying here are the tools, teachers want to see that the kids are building on something and so the change is happening.

A few wanted a more prescriptive approach than was offered in the T-SEDA resources, which intentionally had openness, flexibility and adaptability built into the design. Two facilitators indicated that the materials needed more illustrative examples of specific dialogic moves (Carol) and more structure for participants' thinking processes (Farah). There is a potential tension between over-prescription and floundering that may arise without sufficient support, as four facilitators mentioned; our design deliberately included a set of semi-structured material resources in order to allow for local contextualisation in order to achieve a balance here.

Time pressures—A common challenge for facilitators (with some aspect being mentioned by seven) was to provide sufficient support in regular meetings with participants and keep momentum going, while acknowledging the limited time available for all involved. Suggested time commitments varied and judging what was suitable required sensitivity on the facilitator's part, as one primary school leader in England commented:

> I think I probably should have. . . caught up more with the ones that I thought were slightly wobbly. . . But it's finding time and doing it within a way that's not pushing them and making them feel more stressed about it. (Hannah)

It proved important to allow participants to set their own timescales and meeting schedules. However, one facilitator regretted that there was not enough funding to release teachers. In some contexts schools were unable to get started right away owing to other ongoing initiatives, some found it difficult to schedule workshops at convenient times for all participants outside the teaching day, and some wanted to invest time over longer periods in order to space out workshops and maximise impact. One needed to wait for an end-of-year governing body meeting to permit school-wide use. In one HEI, participants' limited time meant fewer meetings were desired. The facilitator (Marion) reported:

> You know, we tend to work in silos a little bit in the university, so they'll be off doing their thing. I say I'm available. . . I said 'would you like to meet monthly?' and nobody wanted it. They just wanted the introductory, they wanted to get on with it, talk to me if they needed to, and then have this sort of, almost a recap session or a closure session if you like in May. They didn't want any more than that.

She would have preferred more time with the group:

> In an ideal world I would have liked to have had more continuous meetings, just to share experiences and talk about the materials in the pack and challenges and that kind of thing. I think that would have been perfect.

There was also a balance to be achieved between the immediate logistical challenges of conducting systematic inquiry and potential longer-term professional benefits. The ultimate goal of developing professional understanding and practice was salient in facilitators' minds, and could be a long-term objective. For instance, one facilitator saw the focus on learning to code classroom dialogue as 'teaching them a research tool—giving them a tool that they can work with later' (SLTSA).

Discussion and conclusions

Main conclusions

Overall, this study confirms that T-SEDA can help practitioners to look closely, systematically, critically and productively at dialogic interaction in the context of their own practice and goals. The resource pack distinctively offers concrete, generic tools that can be used and adapted for self-directed inquiry in diverse contexts, from early years to higher education. The widespread engagement, spontaneous take-up, and national and international reach attained in this study offer promising implications for future sustainability and wider scalability.

While we know the various motivations of practitioners who volunteered for and stayed with the programme, we are sharply aware that we do not have data from most of those who dropped out at some stage. We do, however, have hints of certain key factors that may significantly disrupt inquiry plans, including competing professional demands, changes at school leadership level or moving to a new school. We acknowledge that in some cases the lack of prescription and close guidance for inquiries may add to the demands experienced by practitioners (although we have little evidence for this). The mitigations and conditions for success seem to lie in the combination of individual professional motivations (including somewhat greater understanding of dialogue) with active institutional support for staff to participate, including a key role for local facilitators (O'Connor & Michaels, 2019).

Facilitators' prerequisite understanding of dialogic principles and practices combined with their responsibility for leading professional development motivated them to take up the role with enthusiasm and confidence—in some cases, working with other facilitators. Several combined roles of research leadership and facilitation, and in a few cases facilitators spoke about learning alongside participants, including conducting their own inquiries.

The importance of securing institutional leadership buy-in and support was highlighted by several facilitators. This resonates with the work of Robinson *et al.* (2009) who found that leaders who are actively involved in professional learning themselves have a deeper appreciation of the conditions required to achieve and sustain improvements in student learning, including making appropriate adjustments to class organisation, resourcing and assessment procedures. Effective professional communities hold a strong sense of collective responsibility and accountability for student achievement and well-being. Improved student outcomes strengthen teachers' sense of efficacy and collective responsibility and this, in turn, encourages them towards greater effort and persistence. The result is a virtuous circle in which teacher confidence and competence and student success are mutually enhancing (ibid.).

Facilitators also needed to secure buy-in from individual participants through helping them understand the value of a dialogic approach, ideally providing 'proof of concept'. Facilitators reported that the provision of friendly and adapted materials (simple, with clear language) was an important support for their role. Local facilitation by colleagues holding some form of leadership responsibility and some prior understanding of dialogic pedagogy falls between the well-established model of external support and leadership and that of more symmetrical peer facilitation as featured in Calcagni's (2020) study. In the latter, close relationships between peers enabled a less formal context for interaction, and the peer facilitator's knowledge of the local contexts allowed them to make connections to the materials and explore limitations of the approach. However, there are risks of participants' superficial understanding or formulaic adoption of the new approach when facilitators are novices themselves (ibid.). The mid-spectrum model emerging in our study appeared to mitigate against this on the whole, although we found that some facilitators' and participants' interpretations of the dialogic moves in the coding framework differed from our own, offering a foundation for co-construction with facilitators who are willing to engage actively with the research team.

Local applications of T-SEDA demonstrate that participants are not just 'going through the motions' of following a prescriptive routine. T-SEDA deliberately privileges local adaptation, ownership and agency over 'fidelity' since implementation of dialogic practice is far from standardised. This living model of research impact or translation is underpinned by the low cost, semi-structured, comprehensive multimedia materials and the light touch (or no) support offered by the university team to autonomous practitioner inquiries. In terms of researcher reflexivity it is important to acknowledge the T-SEDA team's own role in the impact study. The understanding that comes from collaboration and knowledge exchange with practitioners has been fed back into the research of the T-SEDA team, potentially adding areas that had not been previously recognised (e.g. distinctive aspects of early years dialogue) and extending understanding of 'research impact' to be most authentically experienced as a process of mutual benefit. The T-SEDA impact project was designed flexibly to capitalise on dialogic opportunities for learning; the process by which this takes place is expanded upon below.

Knowledge mobilisation and educational change

The T-SEDA study gives insight into processes of educational knowledge creation and changes in practice. Long-standing principles of educational change suggest that both 'meaning' and 'practicality' (Fullan, 1982) are important for practitioners. We fully agree with Gorard *et al.* (2020) that 'just presenting modified summaries of evidence to users, and expecting them to act upon it, is very unlikely to work as a method of translation to use' (p. 587). The systematic development of 'translational research' has been recognised internationally as an essential approach for participatory knowledge mobilisation in education. This requires an infrastructure that combines research evidence with local examples of implementation, developed iteratively as a living, dynamic knowledge base for improving student outcomes (Jones *et al.*, 2015).

We see intrinsic links between T-SEDA inquiry, DBR and knowledge mobilisation. The educational relevance of knowledge mobilisation, comprising an active and purposeful process of co-construction between different stakeholders, has been extensively explored in recent years (e.g. Jones *et al.*, 2015; Campbell *et al.*, 2017; Hood, 2018). In the case of T-SEDA, existing bodies of knowledge about educational dialogue and associated teaching techniques are potentially transformed as the T-SEDA pack passes through different people's hands during collaborative processes of inquiry and development. Hood highlights practitioners' progressive stages of selection, modification, implementation, evaluation and embedding of resources and knowledge. This points to the particular importance of practitioners' engagement in knowledge production, and the associated processes of continuing professional learning that enable pedagogical principles to be securely embedded in, and informed by, practice.

These are complex connections that cannot be fully explored in this paper, but it seems worth attempting to begin to map this conceptual landscape schematically as a basis for further research and discussion. Figure 8 represents our provisional view of the parallel perspectives of knowledge mobilisation and sustainable professional learning connected to T-SEDA inquiry.

This figure depicts the cycles of inquiry and development development in the central column, as follows:

1. previous international research evidence about classroom dialogue;
2. development of first draft of T-SEDA (England and Mexico);
3. piloting of coding framework (Mexico, Australia, England, Czech Republic: Vrikki *et al.*, 2019);
4. translations to Spanish and Chinese;
5. large-scale study in seven countries, producing design principles;
6. further development in response to feedback;
7. publications: website, book chapter, academic papers, etc.

The key participants in knowledge mobilisation (right-hand side vertical box) are in dialogue with each other throughout, including during the initial stages of collaborative development and piloting by academic and practitioner co-researchers. The model of communication that emerged as workable comprised *asynchronous* dialogue with most participants (such as receiving and responding to practitioners' reports). There was more direct dialogue with facilitators as the study continued (workshops and interviews), which supported the ongoing processes of knowledge mobilisation via co-construction of knowledge between researchers, facilitators and practitioners. Facilitators were particularly well placed as knowledgeable local colleagues.

Represented on the left-hand side is the involvement and professional learning of a larger group of practitioners, within and beyond their engagement in T-SEDA inquiry. This may include wider dissemination to professional colleagues as well as their own subsequent developments in practice. T-SEDA may then go 'into the wild'—that is, it takes on a life of its own—as discussed further below.

Three key elements relevant to this approach of dialogic co-inquiry and knowledge mobilisation are: (a) the development of the T-SEDA resource itself (Cycles 1–4

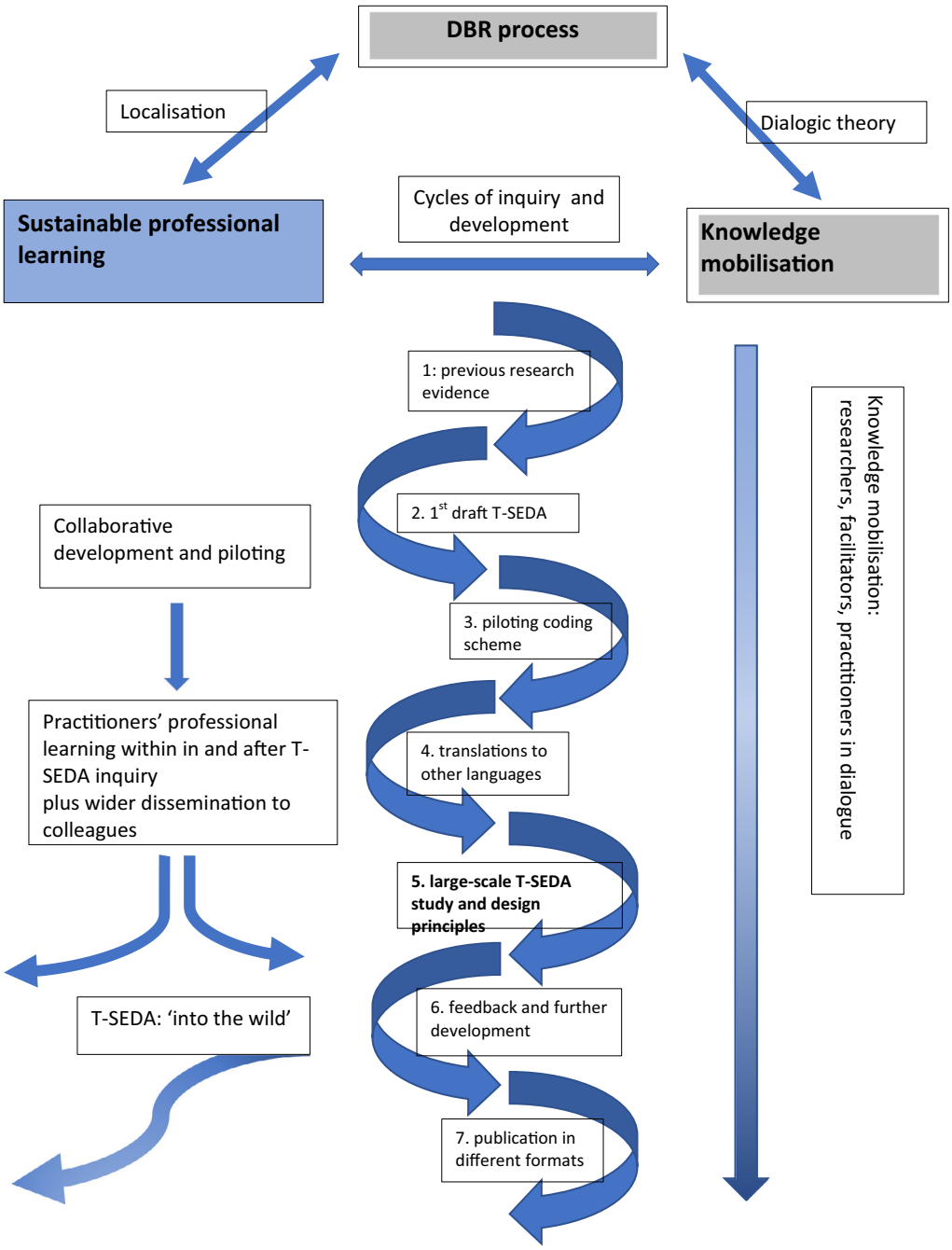

Figure 8. T-SEDA DBR: Dialogic co-inquiry, knowledge mobilisation and sustainable professional learning

above), (b) the means by which the inquiries were facilitated and scaffolded (Cycle 5), and (c) the associated knowledge building in and beyond practice contexts (Cycles 5–7).

Development of T-SEDA pack. In alignment with the DBR model, we actively sought feedback about the T-SEDA pack to respond to teachers' experiences and suggestions driven by interests in how the resources were being used to learn, not just as 'user feedback' on a fixed resource. Initial feedback indicated that many teachers found the pack to be extensive and thus somewhat daunting to read. This led us to put all the sections online separately and to reduce the length of the printed version, leaving some additional resources only online. During the study several participants offered suggestions for improvement, concerning making the materials more user friendly, signposting, and filling some apparent gaps. One of the main needs pointed out was for additional resources for teaching young children; some teachers produced their own and shared these with us, epitomising the intended iterations in open resources.

Substantive adjustments included some made after reviewing early data analysis from colleagues in New Zealand and realising that the coding framework had some ambiguities. We revised it and added further examples of what might be heard in class. This in turn was questioned because the revision had removed a clarification previously agreed with Mexican colleagues, so a chain of adjustments in the English and Spanish versions was required in response to this international feedback.

While the pack resources supported inquiries shaped by local circumstances, not all of what was learned in practice was then passed back to the research team, so some knowledge and understanding inevitably went freely 'into the wild' (see Figure 8). The future development of our resources website may help to capture some of this knowledge by harnessing teachers' adaptations to share more widely. In essence we are curating the pack with continual input from practitioners and further research findings, thus perpetuating the iterative DBR process. The specific elements of dialogue associated with learning gains in the study by Howe *et al.* (2019) were highlighted in the pack as soon as they emerged.

Facilitation of T-SEDA inquiry and scaffolding professional learning. Local facilitation sometimes developed in a 'layered' way with different, complementary goals for participants (e.g. classroom practice) and facilitators (e.g. staff development). The facilitator role called for considerable skill in managing diverse needs, hopes and expectations; contextualising and translating materials for local accessibility, and handling the inevitable time pressures of most complex educational contexts. In terms of knowledge mobilisation, our interpretation is that facilitators created a local milieu for learning, using the flexible, non-prescriptive T-SEDA approach with a high level of agency. Figure 9 represents the points at which facilitators took a particularly important scaffolding role, notably in relation to initial understanding of the importance of dialogue for learning, focusing and conducting systematic T-SEDA inquiry, and sharing the outcomes more widely with colleagues and other researchers—thus extending understanding of contextualised dialogic pedagogy.

Facilitation was crucial in drawing teachers from an interest in new ideas towards a deeper understanding and sustained, transformative embedding in practice. In terms of professional learning, this suggests that collaborative use and guidance with PD resources like T-SEDA can essentially bring in new and diverse perspectives. Hood (2018) argues with reference to her study of online sharing of teacher-produced

resources, that the localness and personalisation required for transferring and transposing resources 'may contribute to teachers favouring resources that reinforce and refine, rather than reorient, their existing practice and procedures' (p. 601). Teachers may contest academic research evidence, ignoring or rejecting it if not sufficiently conclusive or congruent with personal aims and values, and potentially favouring other published sources seen as more authoritative (Cain, 2017). Facilitators' scaffolding and co-construction serve to support what might otherwise be seen as unwelcome or esoteric risk-taking within the complex professional demands faced daily by practitioners. However, a potential tension between prescription and floundering needs to be navigated carefully to provide access to an optimal level of support both in the material resources and from facilitators. This varies with need, so that flexibility is essential for both (as elaborated in the design principles below).

Knowledge building in context. To conclude, the T-SEDA approach comprises a process of dialogic co-inquiry and knowledge mobilisation that respects the 'teacher voice' and draws on often untapped and undervalued practitioner expertise and experience applied in their specific contexts (Rathgen, 2006). Through the co-inquiry, practitioner knowledge is integrated with scholarly theory, interrogating and recontextualising the latter to test its boundaries and fit with practice, and resulting in what Hennessy (2014) has called 'intermediate theory'. The resulting tools and materials are framed in mutually accessible language and made freely available to other practitioners, forming a springboard for further classroom inquiry and modification. This is an active process of 'embedding', in which teachers extract out from the individual resources and situations to establish general ideas that are applicable to a range of

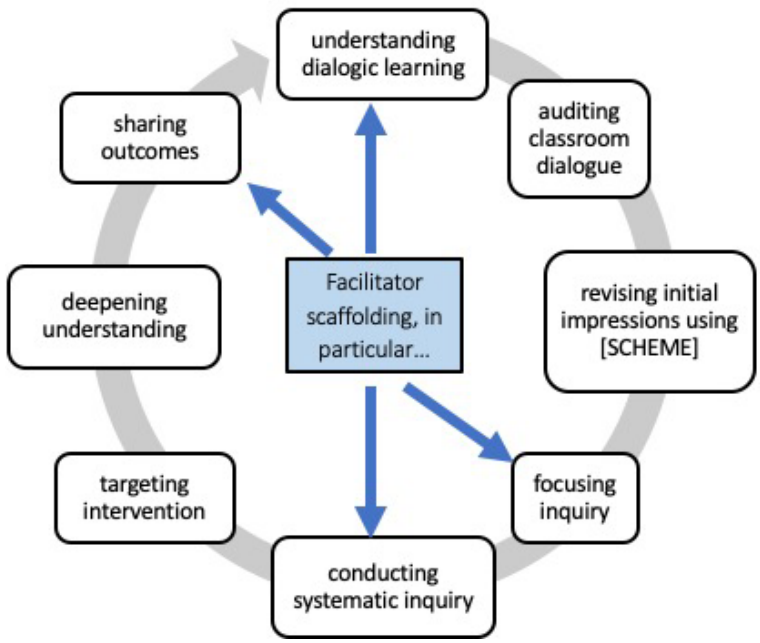

Figure 9. Professional inquiry and facilitators' scaffolding role

situations (Hood, 2018). The reported extension of a dialogic approach to other areas of practice and colleagues resonates with this.

As Lefstein (2010) argues, dialogue can and should be viewed and conceptualised within the complexities of classroom life, taking school realities into consideration or even as the starting point for investigation. This contrasts with attempts to bring idealised forms of dialogues to the complex and crowded schooling system and then, as often happens, concluding it is not possible because of these many constraints. By acknowledging important school constraints and affordances, and working closely with practitioners, T-SEDA's flexibility and teacher-driven forms of inquiry offer a way of connecting to local contexts and understanding how dialogue may be embedded in practice rather than bolted on.

This assertion is consistent with a sociocultural perspective, as discussed by Wolfenden and Adinolfi (2019) in their consideration of the localisation of OER for teacher development in India. From this perspective the proper incorporation of local knowledge extends beyond focusing on existing, and often isolated, cultural practices and events. The quality of educational materials is not inherent, but is better understood in terms of its contextual value (ibid.). Likewise, Joyce and Cartwright (2019, p. 30) assert that 'materials for decision makers should highlight local planning and prediction as an indispensable step'. Uses of resources and tools help to equip and build capacity for future agentive action and educational development, thus completing the design cycle.

Design principles for scalable, sustained and productive professional inquiry into classroom dialogue

The findings and discussion above led us to identify these *preconditions* as optimal for a successful professional inquiry programme:

- institutions foster a sense of collective responsibility for student learning outcomes and recognise the potential of dialogic practices;
- institutional leaders, policymakers, programme designers respect practitioner professionalism and agency and are open to a flexible professional learning approach (vs training courses);
- researchers genuinely value practitioner input;
- practitioners hold a research stance with willingness to engage in critical reflective inquiry and adapt their practices.

The related *design principles* are summarised next (see full version in Appendix S3).

Foundations and processes.

1. Building knowledge and understanding about dialogue
2. High-quality multimedia materials and tools supporting inquiry
3. Critical, systematic interrogation of everyday practice
4. A dialogic, iterative and reciprocal process of design, trial and refinement

Flexibility, local ownership and explicit encouragement for purpose-driven modification.

5. Inviting adaptability of material resources

Programme management and sustainability through local facilitation.

6. Flexible programme design (non-prescriptive and lightly scaffolded)
7. Local priorities and accountability

Coherence between the focus of the approach and the means of professional learning is also desirable. In this case, while focusing on developing classroom dialogue, practitioners and academic researchers also experienced a collaborative and dialogic approach to their own professional learning (cf. Hennessy *et al.*, 2011). This design principle (like some others above) could also apply to other practitioner inquiry approaches; for instance, problem-based learning might be both a mechanism of professional learning of professional learning and a student learning objective.

Limitations

Some methodological limitations are intrinsic to the survey element of the study, including use of rating scales and mainly self-reported data about participants' inquiries (except for a few case studies with video evidence). However, the inquiry reports included detailed and concrete accounts of practice, often accompanied by relevant data. We are thus confident that this material represented the participants' experiences and views. Likewise, Barab and Squire (2004) assert that it is challenging to ensure the trustworthiness of design-based research when a researcher is closely involved in its conceptualisation, design and implementation (although this applies beyond DBR too). However, Anderson and Shattuck (2012) argue that this inside knowledge adds as much as it detracts from the validity. Moreover, the spontaneous take-up and local adaptation by facilitators and practitioners around the globe without any input from our team—and in some cases, without advance notification—seems to raise credibility of the potential for the T-SEDA approach to respond to complexity, given that educational contexts vary remarkably and in unpredictable ways. Controlled studies of a standardised programme will not be feasible with T-SEDA of course, but in any case these suffer from difficulties in distinguishing the 'active ingredients' from the causally redundant ones (Sims & Fletcher-Wood, 2020)—in the same way that as with the outcomes of much DBR, we cannot argue that every design principle emerging is known to be necessary. Our evidence comes largely from practitioners' perspectives.

Another limitation is the reliance on voluntary participation by interested practitioners and research leaders (this is typical of PD interventions more widely too—coercion is rare), although the approach then snowballed within and across certain institutions. Causality is hard to attribute to the persistence with inquiry almost exclusively observed in settings with local facilitators; 95% of participants enjoyed such support. This may suggest that participation in and facilitation of practitioner-led inquiry generally works best in settings with well-functioning professional communities (Hill *et al.*, 2013). These established communities are likely to have already

encountered, and dealt with, tensions when new initiatives appear to place local accountability to existing requirements against professional 'freedom' to develop potentially transformative practices. In this case, even the relatively low formal demands of the T-SEDA study (connected mainly to the limited timescale and reporting requirements) may have inhibited some individual participants from engaging fully with the intended exploratory nature and loose structuring of inquiries. The T-SEDA team's own research needs inevitably affected local implementation, as is often the case.

A final point relates to the limited take-up of opportunities for face-to-face dialogue with participants. While we met some in workshops, including some taking place on school sites, it was inevitably difficult for all national and international participants to attend. In the end this connects with the aim of learning how to scale up and sustain T-SEDA inquiry without direct face-to-face contact, but we would have liked more opportunity to learn with participants during the process itself.

Further research and development

Some specific areas for further research include exploring facilitators' decision making within their delicate scaffolding approach and their brokering role between different stakeholders. For instance, how much autonomy and support for teachers and facilitators work best for different participants, and what contextual factors influence this? Understanding teachers' intrinsic and extrinsic motivations for engaging in professional learning is key.

Participant attrition warrants further investigation, particularly regarding the distinct challenges of dialogic education at secondary school level (11–18 years), which tend to be large complex systems managing different internal and external demands, including high stakes assessment (Hennessy & Davies, 2020). Given that participants who portrayed stronger understandings in their reported examples of dialogic activity were somewhat more motivated or able to complete inquiries, the assessment of support needs for those new to dialogic approaches is an avenue for future exploration. Our experiences of teacher-led PD in countries with very traditional pedagogies and limited PD opportunities (Chile and Zambia: Calcagni, 2020, and Hassler *et al.,* 2018) indicate that peer facilitators there may be less familiar with both dialogic approaches and facilitation and may need more structured support than those in the countries where dialogic approaches are becoming familiar. Revisions to the T-SEDA pack since the reported study added further examples and guidance for focusing inquiries, while preserving teachers' freedom of choice.

Given the key role of local facilitators we need to ask what T-SEDA can offer in contexts where both existing professional learning communities and knowledgeable facilitators are absent. Further investigation of supportive conditions for autonomous inquiry within and across institutions might use a design-based implementation research (DBIR) approach since it is concerned with developing capacity for sustaining change in systems themselves (Penuel *et al.,* 2011).

We do have some indications for the kinds of practical support that practitioners working autonomously would need, though. Three facilitators recommended considering the following:

- Use of targeted online materials including dialogic lesson videos with descriptive expert voice-overs;
- Offer a scaled-down version of the inquiry process;
- Provide case studies of schools that have undertaken successful inquiries;
- Create a personal connection online—in particular around bridging research and practice.

Since the study, we have extended our online collection of freely available lesson video clips to include a few examples from participants and accompanying text explicitly highlighting specific dialogic moves and features of lessons in the clips throughout the collection. Our recent development of a new web platform hosting the T-SEDA and related resources for specific interests—including a discussion forum and ultimately opportunities for practitioners (and academic researchers) to form a community of practice and exchange dialogic teaching resources and inquiry outcomes—aims to address the last two points above. We have also developed introductory videos inducting practitioners and facilitators into using the resources to support use of the pack at a distance, including induction into the principles and practices underlying dialogic teaching. An extended self-audit (6-point) rating scale for measuring change in practice over time has also been developed as a separate tool for pre-service and in-service teachers by Gröschner *et al.* (2020), adapted in part from the T-SEDA self-audit. This may offer further scaffolding and render the principles and practices of dialogic teaching more salient. An online course based around these various resources has also been trialled successfully at our university.

There is a need to include facilitators as active research participants, not just managerial gatekeepers. In contexts where a local support structure is not spontaneously generated it may be necessary to identify people who could be local leaders and help them envision viable and relevant ways of embedding T-SEDA-related PD. They may be encouraged to conduct their own inquiries around facilitation itself, potentially resulting in a 'three-layered' approach to knowledge mobilisation, with complementary aspects of professional learning for all involved. Built-in 'facilitator guidance' could provide scaffolding for novice facilitators and stimulate questioning of the new approaches and their relevance in the context. This approach has been trialled successfully in the aforementioned study in Zambia (Hassler *et al.*, 2018; Hennessy *et al.*, 2016a), where, again, the original two facilitators were unfamiliar with interactive teaching approaches. Including educator notes in T-SEDA could support further scaling too. A prototype MOOC based around the resources has been designed by a doctoral student to offer targeted support for facilitators (as does the web-based Facilitator Pathway developed by O'Connor & Michaels, 2019).

Interest in T-SEDA continues to grow globally and a network of interested schools and professional development leaders is rapidly developing in mainland China. A new initiative is underway to launch a global platform to promote and publish high-quality, 'close to practice' research by and for a very large networked community of practitioner-researchers, alongside programmes to develop school-based research methods expertise using T-SEDA, oracy tools, lesson study and related inquiry-based approaches. We welcome participation of interested colleagues and

practitioners in further T-SEDA inquiries and in the research opportunities that these exciting developments offer.

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Conflict of interest

None.

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Ethics approval

Ethics approval was obtained from the Faculty of Education, University of Cambridge, and the work adheres to the BERA (2018) Ethical Guidelines.

Permission to reproduce material from other sources

N/A.

Data availability statement

The data on which the article is based are not publicly available owing to the need to protect participants' identities.

NOTES

[1] Chartered College of Teaching
[2] 'Early years' participants taught children aged 4–5, equivalent to kindergarten in some countries.
[3] The facilitator in Israel (not formally part of this study) endorsed these messages emerging here about whole school culture, saying 'You need to have … an ecosystem which talks dialogic pedagogy as well, expects students to perform in such ways, or cherishes the attributes that dialogue brings with it, otherwise it's an overhead'.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article:

Appendix S1. T-SEDA coding framework summary

Appendix S2. Scale for rating understandings and examples of dialogue and dialogic teaching

Appendix S3. Full version of design principles for scalable, sustained and productive professional inquiry into classroom dialogue